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THE UNIVERSITY OF ALBERTA

GRADE SEVEN STUDENTS' EXPERIENCES USING COMPUTERS FOR LANGUAGE ARTS

BY

WENDY LEE MATHIEU

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF EDUCATION

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DATE Sept. 21, 1989

Abstract

The purpose of this study was to contribute to our understanding of the nature of the encounter between students and computers in the classroom. The focus was on describing the interaction that occurred between grade seven students and computers as the students used the computers primarily to accomplish language arts activities, while at the same time they learned how computers functioned. I sought to learn, through the students' reflections and behaviors, what it is like for students to use computers and, thus, how teachers can better use computers in the language arts classroom.

I observed the students for approximately three months, every day of the week, one day in their language arts class and the other four days in their computer class. Data collection consisted of three strategies: observation, interviewing, and document analysis. All of the data was compiled into a detailed descriptive narrative of the classroom situation observed. The presentation of the data consists of a chronological story focusing on the daily experiences of the students and their comments about using computers for language arts activities.

The nature of the grade seven students' encounter and experience with using computers was very positive. The benefits appeared to be in four areas: student attitude toward writing; social organization in the classroom; presentation of student writing; and the computer functioning as a helpful writing tool. The computer was seen as having a role in facilitating the teaching and learning of the writing process. It has the capacity to motivate and encourage student writers by improving their self concept as writers. By providing the students more direct control over their writing, it appears that the computer assists students to become more conscious of their writing process. The nature of the computer allows for students to use discovery learning and logical thinking to learn new computer functions to assist them in their writing. Finally, the computer helped draw students' attention to the conventions of writing, giving the students more control over all of their writing.

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Chapter I

INTRODUCTION AND STATEMENT OF THE PROBLEM

Introduction

Computers have made their impact on almost every facet of daily life from children's toys to library catalogues and microwave ovens. People can do their banking in mere minutes at any of the many computerized service centers throughout the city, or the country for that matter. Just as the pocket calculator found its place in our world, so has the microcomputer. Computers are no longer novelties in our society nor in our schools, but have become commonplace. As a result, the youth of today have been quick to adapt to them and to recognize the allurement of computer technology. Many have personal computers available in their homes and perhaps even more have been captivated by the computerized video games in the local arcade.

The attractiveness of computers is also evident in users' often compulsive behavior in relationship to them (Turkle, 1984). Our students appear to be enjoying the new technology and to be finding it both motivating and stimulating. It is important for educators to realize that as our students leave school and get jobs they are entering a society in which the potential of this kind of technology, and the flow of information which it makes possible, are part of everyday life. In our classrooms we must consider whether or not we are providing children with the education they will need to function in a computer-based society and how we can take advantage of the educational possibilities offered by computers in a manner that will enhance learning.

Some educators—who are fascinated by the speed, accuracy, and efficiency of the new technology—have welcomed the "computer revolution." Use of technology in keeping attendance records and student grades and in composing tests and notes means less of the teacher's time is spent on clerical tasks and more time can be spent with his/her students. The computer's ability to individualize instruction, to function as a patient and

encouraging tutor, to motivate students and to make learning exciting, enjoyable, and easy, encourages us to utilize it in our classrooms.

Because of the mathematical basis of the languages used to program computers, the responsibility for computer education in our secondary schools has often been placed in the mathematics departments. Although the initial and predominant use of computers may have been in mathematics in our secondary schools, their impact is also being felt in the language arts classroom. "English teachers dwell in a world of words, of literature, and of the imagination. We should be in the vanguard for discovering the potential for computer technology in learning and in shaping language and thinking" (Woods, 1983, p.35). The computer, in some capacities, perhaps has more potential for language arts teachers than it does for our colleagues in mathematics.

As computers have been introduced into schools, those responsible for their implementation have been relatively careful to introduce teachers to the new technology, to educate them in its ability, and to evaluate its usefulness from the teacher's perspective. The concern of the teacher's relationship to the computer has been addressed, but has the relationship between the student and the computer in our classrooms been examined closely? In a subject traditionally devoted to pen and paper, it is important that we consider the students and their perceptions and reflections based on their experiences with using microcomputers in secondary language arts.

If we consider that computers are an integral part of our society and that there are benefits to utilizing them in our classrooms, it is important to assess how our students are experiencing computers in their language arts classroom activities. What does it mean for students to experience microcomputers as part of their secondary language arts class? What is the nature of the experience between the students and computers in language arts? What are their feelings, perceptions, and reflections about using a microcomputer for language arts in a classroom setting? Can their perceptions help us to learn more about the nature of the meeting between the secondary language arts student and the computer? Can students'

reflections give us more information about the student and the language arts curriculum as mediated by the computer? What can we learn from our students that supports our desire and need to use computers in our secondary language arts classrooms?

Definition of Terms

Computer-Assisted Instruction (CAI): use of computers to direct the student as the passive recipient of instruction e.g. drill and practice.

Computer-Assisted Learning (CAL): use of computers where the focus is on extending the learner's ways of understanding and learning. The learner is in control and has more power to create than in CAI.

Naturalistic inquiry: a participant-observation methodology in which data collection requires field study in order to observe and record natural processes and behaviors in a particular setting.

Secondary student: a student in one of the grades from seven to twelve.

Word Processor: a computer program that accepts and manipulates text on command from the user (Daiute, 1985).

Purpose of the Study

The purpose of this study was to contribute to our understanding of the nature of the encounter between students and the use of microcomputers in the classroom setting. The focus of the study was to look at the experiential stance of the question 'What's it like to be with a computer?' — for particular individuals (grade seven language arts students), at a particular time (during class time), in a particular place (a grade seven classroom), for a particular task (to achieve the objectives of language arts) (Dillon, 1985). On the assumptions that it appears the computer-age is here to stay and that there are benefits to

using computers in teaching and learning, as researcher, I sought to describe the students' experiences of using computers in a classroom setting for language arts activities.

Research Questions

In approaching naturalistic research, I attempted to be open to the many influences that could not be foreseen. Even so, certain areas were predetermined to be likely areas of interest. The students were the focus and as such their perceptions, in terms of knowledge, attitude, bias, and understanding, both of the technology and its effect on educational praxis, were assumed of considerable importance. The following questions provided the focus of these areas of interest:

1. What is the nature of the students' encounter and experience with using microcomputers for grade seven language arts activities in the particular classroom being studied?
2. What insights into grade seven language arts can be gained from the behaviors and comments of students utilizing computers in the classroom?
3. Do students perceive shifts in their roles or in their teacher's role, or changes in classroom atmosphere as a consequence of the introduction of microcomputers? If so, what is the nature of these changes?
4. What is the role of the computer in students' learning and 'languaging' in language arts?
5. What do we need to provide in a classroom computer environment to teach language arts?

Procedures

Through a naturalistic case study approach, I attempted to describe students' experiences using microcomputers in the classroom for grade seven language arts activities. I sought to provide as in-depth a description of the phenomena as possible from the

methods employed. I wanted to study people where they were and as they went about their normal routines. The research questions were answered by observing and participating in the natural events of daily life and the settings in which they occurred. Naturalistic researchers have no preassigned design that specifies what kind of data will be collected from whom on what date (Smith, 1982). The phenomenon was studied first hand and over a period of approximately three months using unstructured observation, interviews and document analysis.

One language arts classroom was selected for study on the basis that the teacher was utilizing computers in the classroom for language arts activities and that the teacher was receptive to having a researcher in her classroom. The intended focus of the study was on the students' experiences using computers in the classroom. I recognized that the students would vary in their degree of "computer literacy" but I did not feel that this would undermine the credibility of the study. The focus was not on the students as a homogeneous group but rather on the students using computers in a particular environment —the classroom. Teachers are always faced with students who have varying degrees of knowledge and skills in a classroom situation and so "as we investigate computer use in classrooms we must remember that it cannot be acontextual, asocial, or apolitical." (Dillon, 1985, p.107).

Observation occurred on all days that the computer was being used to fulfil language arts objectives. The study began early in October and continued until the Christmas break in December. I observed the students every day of the week, one day per week in their language arts class and the other four days in their computer class.

Initial data on the students' perceptions and experiences of language arts and computers was gathered by having the students answer questions on a questionnaire. By having the students answer some initial questions on the topic, and with the aid of the two classroom teachers involved in the study, I chose three students to use as key informants. One of the students had a lot of experience with computers, another had limited experience

with computers, and a third had virtually no experience with computers. Data collection throughout the remainder of the study was gathered by the three methods cited below.

The main data collection method was observation. Observation was done free-form. For each instance of observation, I recorded the physical surroundings, the arrangement of physical objects in the space, the actors or participants, the behavior, verbatim language, acts, events, time sequence, gestures, and the like (Smith, 1982). As participant-observer, I functioned primarily as an aide to the classroom teacher, although through the course of the research, I took on different stances of engaged versus detached observation (Rist, 1982).

The second strategy of data collection, interviewing, helped me uncover personal meanings held by the various participants. The interviews included both formal and informal interviews, each giving me the opportunity to learn more about how the actors in the setting perceived their environment, understood their actions, and anticipated the views and behaviors of others (Rist, 1982). Interviews provided multiple perspectives and insight into the personal meanings that underlie behavior (Smith, 1982). Formal interviews were held with individuals and were recorded on tape. In interviewing, I used some basic questions as a general guide, although there was an attempt to keep the interviews as conversational as possible. Tapes were transcribed.

Document analysis, the third data collection method, included any written material available to me and relevant to the topic. It provided important insights into both public (frontstage) and private (backstage) perceptions, rules, guidelines, and images (Rist, 1982). In this study I examined documents such as teachers' assignments and students' work.

Through data analysis I attempted to compile all of the forms of data I collected into a chronological story of the experiences of grade seven students using computers to accomplish language arts activities. The emphasis of the study was on description and

interpretation rather than on measurement and prediction. The findings are presented in the form of detailed descriptions and analyses of the setting, participants, and interactions.

Delimitations

This study was restricted to one classroom. Observation in the study was restricted to the area of grade seven language arts students using computers in conjunction with their language arts class . The study was limited to approximately three months with observations occurring every day of the week, one day per week in their language arts class and the other four days in their computer class.

Limitations

The following limitations characterized this study:

1. The observation of only one classroom limits the possibilities of making any generalized discoveries.
2. The possibility of bias or lack of skill of the interviewer does exist.
3. It is not known how the presence of the researcher affected the students' behavior and responses.
4. The value of the data is limited by the observational and interpretive abilities of the researcher.

Assumptions

The following assumptions characterized this study:

1. The presence of the researcher would have some effect on the students' behavior and responses.
2. Students at the grade seven level would be sufficiently mature to be able to articulate their perceptions of, and experience with, language arts and computers.
3. The respondents would be direct and open in replying to any questions.

4. The perceptions of the students could be adequately interpreted using the methods designed for this study.

Significance of the Study

Daiute (1986), Papert (1980), and Mittricker (1983) have found that the use of computers for word processing programs can assist students when writing. Much research has also been devoted to the teacher and implementation of computers. There are an endless number of writings about how teachers have used or can use computers in their secondary language arts classrooms. However, very little has been written from the students' perspectives about their experiences with the new technology. The greatest resource for learning in education is our students. This study is an exploration into one area of microcomputers in secondary language arts —the experiences of students using computers in the classroom to accomplish language arts objectives.

Overview of the Study

This first chapter outlines the nature of this study, its purpose, and the questions it endeavored to answer. The design of the study is briefly discussed, its limitations stated and its significance mentioned. Definitions of terms used throughout the study are also included.

Chapter II provides a review of the literature about computers and writing. The discussion of the research concerning word processing and writing is organized under four headings: 1) Studies of Attitudes Toward Writing Using Word Processing 2) Studies of Collaboration 3) Studies of Composing, and 4) Studies of Revising.

Included in Chapter III is a description of the design of the study and a detailed description of the context of the study including the setting, the participants, and the tasks. Pseudonyms have been used for the names of the participants and the name of the school.

Chapter III also includes sections on the three procedures employed for gathering data—observation, interviews, and document analysis.

A detailed description of what I observed during the time I spent in the grade seven computer and language arts classrooms, comprises Chapter IV. It is a compilation of all the forms of data I collected into a chronological story of the experiences of grade seven language arts students using computers to write. My purpose was to see through the eyes of the grade seven students as they experienced working with computers. Thus, the description focuses on their daily experiences and their comments about using computers to complete language arts assignments in a classroom environment.

In the final chapter, the study is summarized. Findings and conclusions are presented in the form of answers to the research questions asked. Implications for teaching identified in the study are discussed in answer to one of the research questions, and recommendations are made for further research.

Chapter II

REVIEW OF THE LITERATURE

Computers and Language Arts

As computer technology continues to permeate our society, attention needs to be given to the effects that this technology has on the language arts classrooms and education of our students. Throughout the literature concerning microcomputers and language arts there are suggestions for numerous ways of utilizing computers in one's classroom. The focus of computer-assisted learning (CAL) is on extending the learner's ways of understanding and learning. The learner is in control and has more power to create. "Control of a function is the counterpart of one's consciousness of it" (Vygotsky in Woods, 1983, p.33). Students must be given the opportunity to control and direct their own thinking. They must reflect on their language and thus on their thinking through their reading and writing. For this freedom to create and control to occur, language arts teachers must provide students with opportunities to create and control their language and thinking. The world of the microcomputer has much to offer here (Woods, 1983).

CAL has been found useful for simulation activities in which an imaginary environment is created that poses problems for the student to solve. Even though simulations are not the real world, they enable the student to be part of an environment, and experience, in some ways aspects of the real world (Carss, 1983). With computer simulations, the teacher is freed of the direct management of the students, and students are freed from the teacher, thus promoting more informal group discussion among students. Using the computer as a learning resource has been found to lead to an increase in useful talk and collaborative activities, even in classes where such activities were already encouraged (Chandler, 1984). Students take on a more active role in their learning while the computer takes on an interactive or passive role.

Computers can provide the student with assistance in understanding particular concepts. With the computer the child must define the problem, identify possible approaches to its solution, and finally tell the computer what to do. It is often said that one does not truly understand something until one has to teach it. The computer becomes the other person to be taught when used in this fashion which is sometimes called the tutor mode. It asks the questions as the student provides the correct answers in order to make the computer program work. In the instructional form, the computer can act as an individual tutor of unlimited patience. Lessons available on computer may be useful as a means for reviewing material by students who were absent or who need reinforcement (Auten, 1984). Benefits of individualizing instruction include: immediate and personal feedback, individual pace of instruction, freedom from competition inherent in group behaviors, and minimization of the fear of failure. It is not envisioned that the computer will replace the teacher but it can imitate good instruction and make that available to students individually.

The computer games available, especially text-adventure games, promote the computer to be used in a more conjectural form in which it helps the learner to formulate and test hypotheses in pursuit of an objective. Such games create a very active reading experience or at least an activity where the player is not only entertained by the story but can have an impact on how the story develops. Interactive fiction injects new excitement into reading for students who view current forms of reading as being passive or dull (Loftus and Nelson, 1985).

Clearly computer applications in the form of computer-assisted learning, simulations, and games affect many areas of the language arts. Of all the applications of computers to language arts, however, the biggest impact has been made by word processing. Dissatisfied with the poor quality of much of the software produced for language arts or because of a lack of funding to buy software, many teachers may have been either turned-off using computers for language arts completely or have turned to using

word processing. A word processing program is one of the first software programs most schools purchase to use with their computers. A more apparent reason for the impact word processing has had on language arts is that word processing is a tool that is capable of quickly and easily manipulating text and, therefore, influencing the way people write.

Word processing and its effect on writing and writing instruction has received significant attention by researchers and teachers in the field of language arts. Because the research concerning word processing and writing is extensive and varied, I have organized my discussion of it under four headings: 1) Studies of Attitudes Toward Writing Using Word Processing 2) Studies of Collaboration 3) Studies of Composing and 4) Studies of Revising.

Studies of Attitudes Towards Writing Using Word Processing

The majority of researchers and teachers who have studied word processing and writing comment that using a word processor improves students' attitudes toward writing. Baer (1986) in her case study researched children and their attitudes toward word processing and writing. She found that a majority of students enjoyed writing more when they used the word processor because their writing mistakes were easier to see and correct, the final product was neater, and their hands did not get as sore as when they wrote with pen and paper. The few students who did not enjoy word processing felt they could write faster and had more control using pen and paper. These were also the students who had not learned to use the computer's functions well.

Second and third graders in Kahn's study (1988) described writing with word processing as easier than writing with pencil and paper. The children felt they wrote more fluently with word processing. Kahn said that editing was done with enthusiasm and persistence. Students' responses to writing using word processing at the college level concur with those of beginning writers. Barker (1987) found that all subjects responded favorably to the use of word processing. It did not affect the students' understanding of

the writing process but was credited by them with stimulating text production and revision. Word processing was viewed as having a positive influence on the students' attitudes and writing behaviors.

In her ethnographic study of computer-writers in an undergraduate composition class, Logan (1988) heard students describe an array of reactions to writing with the computer. These reactions ranged from fear and great respect to the belief that computers were merely effective writing tools. Time, mood, typing ability and environment were all crucial concerns as these writers adapted their composing habits to the setting of a computer writing lab. Students still cited the advantages of the computer in revising and as a stimulator of ideas.

Grades 7-12 students under the observation of Katz and Hoffman (1987) participated in a school Writing Through Word Processing Project that was studied from 1983-1986. Some observations made by the researchers follow: students were writing more and were more willing to revise using a word processor; students' own expectations increased as evidenced by the more careful attention they paid to punctuation, spelling and grammar in their writing; gains were made in writing skills and pride; the facility for students to edit their own and others' work was an incentive to revise; and students finally viewed writing as fun.

Kurth (1987) conducted a study of grade nine students utilizing word processing for their writing. When the results of the attitude inventory she had issued were analyzed, the word processing group felt more positive about the instruction they had received, more positive about their ability to write, and more positive about editing groups than the non-word processing group.

Margaret Mittricker (1983) suggests that students are motivated to write more and that their responses to writing assignments are positive as a result of using the word processor. Daiute (1985) has found that word processing can assist students who encounter numerous different problems in writing. Papert (1980) cited children in his MIT

computer center who went "from total rejection of writing to an intense involvement (accompanied by rapid improvement of quality) within a few weeks of beginning to write with a computer" (p.30).

Writing enthusiasm cannot be generated simply by having students compose at a microcomputer, but teachers can use computers to develop the interactions essential to establishing a sense of writing competence, and hence, writing enthusiasm (Leonardi and McDonald, 1987). Rodrigues (1985) comments that when students learn word processing, their attitudes toward writing appear to improve. She found that the most important effect of computers on the behavior of basic writing students was in their role in moving students toward more independence as writers. "The computer helped students to internalize the writing process and to gain confidence as writers" (p.339).

Studies of Collaboration

Writing using the word processing capabilities of a computer has developed a growing interest in the area of word processing and the collaboration among teachers and students while writing. The screen makes the process of writing more susceptible to study because of its public nature. A review of the research in the area of collaboration and word processing has generally discovered that word processors encourage collaboration among writers, assisting the sharing of writing problems and concerns and developing strategies to deal with these concerns (Barker, 1987). Hermann (1985) found that the computer served to bring together students from different academic tracks. Microcomputers in many classrooms seem to give rise to more social interaction, more talk, more spontaneous coming together (Greene, 1985).

The public nature of the computer screen appears to facilitate more discussion and group editing and revising because the screen provides easier access to the print (Kurth, 1987). Jackson (1987) in her work in a Birmingham boys' school observed an increase in talk and collaborative activity when students used word processing. Stapp (1987)

researched cooperation among pairs of students involved with a computer compared with a pencil and paper task and found that students cooperated with each other more and scored higher on measures of academic performance when involved with a computer. Students working at the computer also demonstrated more peer teaching behavior.

Sudol (1985) notes that word processing in the teaching of writing offers an opportunity to reinvent the classroom model in the context of the new technology. When writers perform the writing process in all its stages in a room full of computers, rather than in solitude, they form a community in which their work becomes a public act thus providing a setting for collaborative learning. This writing environment frees students from the idea that what they write is only for teachers to evaluate. The computer with word processing facilitates peer conferencing. The public screen is apparently irresistible as other students walk by and read work in progress (Kahn and Paris, 1986).

Daiute (1985) writes extensively about the atmosphere of collaboration that is created in writing classes using computers. Writing classes with computers tend to be student-centered and are characterized by a great deal of writing going on. Teachers and researchers have noted that when a computer is used children spontaneously share their writing—both the problems and the successes. Shared writing activities help writers learn about voice and their reader's needs. Students enjoy using word processing for writing because they feel they can work more freely and that free expression leads to good writing. Daiute (1985) thinks young adolescents can benefit from a collaborative writing environment:

> The social awareness that grows during the years from ages 9 through 13 affects writing development in many ways. Children in that age range ask one another questions about writing, and they offer help to one another.... As children look outward during these years, they also begin to look inward. They begin to react to others' comments about their writing and to reflect on their own thoughts and writing. In contrast to younger writers, who consider writing to be fun for its own sake, these children write for more practical reasons—to communicate, to inform, and to entertain.... The collaborative and communicative writing environments available on the computer are especially useful to young adolescents...(p.168 and 174).

Computers also offer the opportunity for networking, a new collaborative writing activity. Recent research indicates that computer networking holds considerable potential for providing students with meaningful, well-structured, collaborative learning experiences (Garrett-Petts, 1988). The concept of writing as a process of social interaction, rather than an individual one, may come to challenge the idea of individual authorship.

Studies of Composing

Although studies in collaboration and attitude are really in their infancy, research on the writing process using the word processor has been in progress for a much longer time. Most teachers of writing are acquainted with the writing as process concept of composition and see writing as a recursive activity that has at least three major stages: prewriting, writing, and revising. The recursive nature of the writing process makes it difficult to study because the stages tend to flow one into the other. Most research in word processing and composing has thus focused on one of the stages in the writing process, although some have looked at the entire process. Overall, word processing supports a writing-as-process approach to instruction (Artz, 1987).

Research that has been done about the first stage of writing—prewriting, drafting, planning, outlining—suggests that initial planning (before starting writing) and evaluative planning (rereading after having written) is reduced when composing with a word processor (Haas, 1987). Writers are willing to plan less and write more freely when using the computer. They see the computer as an enabling device, because it encourages writers not to be committed to what they have written the first time (Lutz, 1987). Beserra (1986) found basic writing students, when using word processors for writing, devoted more time to composing, revising and editing, but failed to demonstrate prewriting more often.

There have also been a variety of prewriting programs developed to help students in this stage of the writing process. Due to demands on teacher time and energy students may not receive enough attention and instruction from the teacher during the prewriting stage of

the writing process. Strickland (1985) suggests the use of prewriting programs to afford students the extra time and instruction needed. Computer-assisted prewriting programs can direct creativity, suggest strategies, play audience, and dislodge writer's block. Strickland says a good pre-writing program is one that has branching capabilities and is interactive, responding to the user much the way humans do in conversation. Presently, prewriting programs are in the frontier state of the art, but should be considered for the future of word processing and writing. Every writer has a personal style and no one prewriting program will work well for everyone (Parham, 1986).

Teachers and researchers have much to say about the observable changes word processing generates in the actual process of writing. Moran (1983) feels the word processor can provide for a more open writing style with more of the rhythms of the spoken language in it as the word processor allows one to create and produce more language, both good and bad. With the ease and flexibility of editing later, word processing removes from the revising process the "copying penalty."

Both Rodrigues (1984) and Carss (1983) discuss the concept that writing with a word processor helps to minimize the fear of failure students experience in writing. "The computer is infinitely patient, allowing the students to experiment with ideas, to play around with words without any fear of being criticized for not being exactly on target—in short, to take risks that move writers toward greater competence" (Rodrigues, 1984, p.28).

In her classroom, Womble (1984) found that "writing with the word processor helped my students become more aware personally of what happens intellectually as people write. They were able to articulate clearly and decisively the methods they followed both with and without the word processor" (p.37). The computer as a word processor allows the writer to take greater control of the writing process. Removing the physical factors on writing gives more time for creating, re-creating, thinking, reconstructing, and reflecting (Woods, 1983).

The degree of difficulty of the word processing program used by different researchers has produced contradictions in results concerning the amount of writing produced on a word processor and, ultimately, the quality of the final product. Some researchers have found that on the whole, writers produced more words when composing (Haas, 1987; Kurth, 1987). Research by Donald Graves (Green, 1984) and Peggy O'Brien (1984) in the use of word processors for writing indicates that composing on the word processor aids students in developing their texts in the areas of length and idea processing. There exists no conclusive evidence that word processing improves the quality of students' writing. The quality of the computer system being utilized seems to affect the quality of the writing (Haas, 1987).

Perhaps the only conclusion that can be drawn about composing with word processors is that they do have an impact on writing and that the degree of the impact is different for every writer depending upon the individual's adaptation to the tool. As the computer becomes a more integral part of society, and writing, the question of the impact the word processor has on writing may disappear completely.

Studies of Revising

Variables in computer and word processing program design, in the amount of word processing instruction and writing process instruction given to students, have all created a wide variance concerning the effects of word processing on revising behavior. Regardless, research into the effects of word processing on revision has drawn attention to the level of revision (surface versus more substantial revisions) and the number of revisions made by writers.

In comparing the changes writers and editors made using pen and paper to those made working on a computer, Lutz (1987) found that, in general, the computer users made more changes at lower linguistic levels; they moved in smaller chunks from one change to the next, and they moved more frequently. Clearly, the trend to make more changes

suggests that the ease with which the computer allows changes does encourage writers to change more, that the ephemerality of the mode actually encourages writers to make more revisions. Lutz also notes that the hardware and software limitations of word processing directly affect the focus of the writer's attention. If writers do all of their composing at the computer, they may have a tendency to focus only on lower-level changes. Thus they may need to be encouraged to use hard copy or pen and paper composing for such things as reordering and organizing larger chunks of the text, such as paragraphs (Lutz, 1987).

In studying the revision and writing quality of seventh graders' composition with and without word processors, Bierman(1988) discovered that students who composed and revised on computer could make substantially more revisions when they resumed pen and paper composing and revising; however, use of the word processor did not differentially affect types of revisions attempted or writing quality. Word processing increased the students' motivation to detect and eliminate textual problems.

Van Hooydonk (1986) in her study of two grade seven competent writers found the word processor to be a useful writing tool which assisted students significantly in the areas of revision and editing. An analysis of the revisions carried out on the students' writing indicated that the majority of revisions were in the categories of mechanics and style, with the most significant revisions occurring in style.

Fernandez (1987) in his research on the influence of word processing on the written revision practices of sixth grade students concluded that there was an increase in the amount of revision which went beyond the usual surface corrections and included word and content change, movement of text, deletion and substitution of ideas and an overall reformulation of context. His subjects exhibited a more positive attitude toward revision after the intervention of word processing.

Working with four inexperienced high school students, Grizinski (1986) concluded that the students produced more and revised more when writing with word processing. McAllister and Louth (1988) investigated the effects of word processing on the quality of

revision of 102 college basic writers and reported that word processing does have a positive effect on the quality of revision in basic writers. Kurth (1987) found that the use of the word processor by grade nine students resulted in them producing longer compositions than those not using it, but there were no significant differences between the two groups when the papers were analyzed for number and type of revisions.

Evidently, the effects of word processing on revision in writing are inconclusive in terms of the possible benefits word processing affords revision behavior. There are so many variables in studies addressing the issue of revision, the only conclusion that can be drawn is that the word processor does have an effect on the revising of writing and the computer has made researchers, teachers and students more aware of the area of revision. As the technology of both hardware and software continue to advance, so will the research into the effects of word processing on the attitudes of writers, on composing and revising processes, and on the writing environment. The computer continues to challenge us in our research about writing and in our teaching of writing.

Chapter III

DESIGN AND PROCEDURES

The Design

O'Brien (1984) and Mittricker (1983) both found the computer, as word processor, to be a highly motivational tool for students' writing. William Zinsser (1983), a professional writer who uses word processing to assist him with his writing, considers its use just as invaluable for children:

> The new technology could erase the biggest obstacle that frustrates children learning how to write: the sheer labor of writing. Children are natural writers. Their heads are full of imagery and wonder and wordplay and free association; their use of language is fresh and unexpected. But their hands are far slower than their thoughts... I can't think of a quicker way to give them a sense of enjoyment that comes from playing with words than to let them write on a screen where all things are possible and all mistakes are instantly forgiven, where the touch is light and page is forever tidy (p.61).

Such positive comments about the attributes of using the word processor in writing composition are echoed by numerous others (Moran, 1985; Rodrigues, 1984; Carss, 1983; Womble, 1984). This study was designed to "discover what the [computer] experience is for pupils, not settle for the adult-eye view, encapsulated explanations and theories that have been handed onto us and which uncritically we mouth...we need to see through the eyes of real individuals, to feel with them, as they experience computers" (Dillon, 1985, pp.101 and 105).

A naturalistic case study approach was implemented in this study. It was naturalistic in the sense that I entered the natural setting, the classroom, in an effort to gain an understanding of the experience of students writing with computers in *their* environment. The purpose of the study was to study people where they were and as they went about their normal routines. Spradley (1980) classifies this type of research as ethnography, which is the work of describing a culture. The objective was to gain an understanding of the way of life in the particular classroom situation being observed.

Rather than 'studying' the people, ethnography means 'learning from people' (Spradley, 1980, p.3). I hoped to learn from the students what it was like for them to use a computer for their writing.

As the researcher, I became part of the cultural terrain being studied. I adopted a dual role simultaneously and alternately engaging in and observing the classroom activities. My degree of participation was generally very active, but ranged from engaged to detached. Spradley (1980) describes this as the insider/outsider experience. The first step in the study was to locate a social situation which consisted of the place (setting), the actors (participants), and the activities (tasks) (Spradley, 1980).

The Setting

Woodland School was the setting of the study. This school is a kindergarten to grade nine school that is located on the perimeter of a university campus. A French Immersion Program is in place from kindergarten to grade six, at which point students must transfer to other schools to continue in the immersion program. There is also an English K - 6 program. The junior high school is conducted in English and thus the school sees a fairly major change in student population from grade six to grade seven. The French Immersion students transfer out and many other students from surrounding feeder schools transfer in for junior high school. The particular school used in this study was chosen because of the program the teachers and administration had implemented for their grade seven classes. The whole year plan for the grade sevens had been carefully considered. In previous years it was perceived that with the influx of grade seven students from many feeder schools, the students had not come together as a group, but rather had developed many small cliques. Early in the school year in which I conducted my study, the administration and the grade seven teachers organized a three-day outdoor retreat for the grade seven students in an attempt to bring them together in a social setting outside the school and have them mix amongst themselves. The school staff hoped this would

eliminate the fragmented social organization that had permeated the grade sevens of previous years.

In an effort to meld all of the grade seven students into a more homogeneous and cohesive group, a team approach was adopted. One teacher would teach the majority of the students language arts, another science, another mathematics, and so on. The teachers became known as "The Grade Seven Team" and worked together in an effort to make the grade seven classes a distinct group as a whole.

In addition to the one teacher teaching each class the same subject, it was also the decision of the teachers in the school that the grade seven students be given extended computer time to teach them the basics of computer use early in their secondary schooling. Extensive computer exposure in grade seven would enable them to use the computer in their future school work. I chose this particular grade level to study because of the above mentioned factors and because the grade seven students at Woodland had been allotted more computer time per week than any other grade level in the school and, according to the computer teachers, quite possibly more than any other class in the school system.

The computer classroom was equipped with twenty-seven Apple IIe and three Apple IIGS computers and three printers. One computer at the front of the classroom was hooked up to a large television display monitor for demonstration purposes. The computers were placed around the perimeter of the classroom and regular classroom desks filled the remaining space in the center of the classroom. Each student had his/her own computer to work on and the computers that were connected to the printers were left empty, if possible, in an attempt to allow more access for printing.

The language arts classroom was arranged so that the students desks faced the center of the classroom, leaving space empty at the front and back of the room for conferencing on writing. Small carpets were made available for the students to sit on in the conferencing area at the back of the room. No peer conferencing was to occur in the area of the classroom where the desks were. This was where the individual writing was to take

place. Students were requested to refrain from talking in the writing desks and reserve their discussion for the designated conference areas.

The Participants

The Computer Teacher - Mr. Cambridge

The computer teacher, Mr. Cambridge, was also the homeroom teacher and mathematics teacher of Grade 7E. He was very willing to be involved in a situation where students were using the computer for actual school assignments. His philosophy concerning the computer's role in students' learning and the implementation program he uses can best be described through his own words.

W.M.: What role do you think computers should play in students' learning in the school setting?

Mr. Cambridge: A different role depending on the student and of course upon the teacher. In general, at the Junior High level I think it's a really great thing that can be used as a tool, as a word processor; that's the big thing. Kids should be able to word process so they can write, revise and so on. That's the number one use of a computer. Also, a computer can be used with individual kids with specialized programs. For a kid that's having trouble with something—quite often there is a program where the kid can sit down by himself and work on something, like phonics or multiplication facts or whatever. Generally speaking that probably covers it because of the programs that are now available. Not that the computer won't in the future have new programs available.

W.M.: What about programming and such? Do you see a place for it in the Junior High program?

Mr. Cambridge: No, no. Programming—we went through that phase of trying to teach the kids to program and it's useless. Not useless, but it's like teaching kids that if they want to cook they have to learn to grow a garden first, and they have to learn to raise beef and how to slaughter beef before you allow them to attempt to cook a steak or wiener. You don't need to be a programmer to run a computer.

W.M.: Do you have kids who want to program?

Mr. Cambridge: A couple of them have asked me about it, but very few. They don't press it.

W.M.: Can you review what your Grade Seven Computer classes did prior to my coming into your classroom, what they are doing now, and where you plan to go?

Mr. Cambridge: We started with a little bit of an introduction to the computer, it's various parts and so on, but most of them have that from elementary school. Almost every elementary school is dealing with computers these days. Then we went into keyboarding. We worked with the program *Superkey* and worked with that for quite awhile. Then we started in on word processing with the *Appleworks*. Now we've gone into databases, working with the database part of *Appleworks*.

W.M.: Are you doing that in conjunction with any other subject?

Mr. Cambridge: Not at the moment; however, my two classes have an assignment to do a database of their own choosing. Some of them have chosen to do something that is connected with a science classification of plants and animals. Most of them are doing their record or comic book collections or some are doing their school timetables.

W.M.: Then after you do databases what will you do?

Mr. Cambridge: We go into integrating databases and word processing. Possibly into spreadsheet a little bit. We will go into some LOGO and also a little bit of BASIC programming, But always with the idea of the computer as a tool. I try to give them examples of how they could use their database sorting out a time line in social studies. Sorting things by dates, countries, and various other ways.

It was Mr. Cambridge who suggested to the language arts teacher that their students use the word processing function of the computer in conjunction with their assignments from language arts class.

The Language Arts Teacher - Ms. Marchand

Ms. Marchand taught four of the five grade seven classes language arts at Woodland School. In trying to understand her language arts program, I asked her to talk about her philosophy concerning students and writing.

> Well I can't say it in three words. It's changing all the time but I'd say that my philosophy is that they should use their writing to share their experiences and that it should be relevant. And that they can do their editing and their own drafting. It's a process that's always ongoing, that is always growing. All the skills that one has to teach in language arts can be taught while they write, not as an individual unit.

She organizes part of her grade seven language arts program within a Writer's Workshop approach adapted from Nancie Atwell's book, *In The Middle*. Ms. Marchand's adaptation suits her personal teaching situation and style. The double period that I observed each

week was used for Writer's Worksop. Her classes see students writing in a variety of forms on both assigned topics and ones freely chosen by individual students. A lot of class time during the Writer's Workshop periods is spent by the students being actively involved in their writing or in conferencing with either the teacher or their peers. Ms. Marchand emphasizes the writing process, as well as the product, by encouraging revision and publication of student work. Her students have writing folders in which they save all of their writing ideas and drafts. Displays of polished writing adorn her classroom walls and hallway bulletin boards. During the time I spent there, her students were also involved in writing for an in-school "Ballad Contest" and in submitting pieces of writing on a particular theme for possible publication in the school system's publication of student work called *Magpie*.

When asked to reflect back on her initial thoughts about her students using computers to do their writing, she responded:

> I wasn't sure actually. I thought maybe that most computer programs with language aren't very successful. The ones I've been involved in before had been more game oriented and skills and things. I had no idea that it would be as successful as it was. I thought some of them would choose not to use the computer because of some of the same sort of feelings I have—that it's a foreign instrument and I don't want to touch it but it turned out.... I guess I had high hopes for it, but I certainly didn't think that it would be what it is. Because it's extremely successful and I'm quite surprised. I'm delighted.

The incipient skepticism she had about her students using computers for writing I felt myself at one time, and I'm sure is shared by many language arts teachers who have not personally experienced writing with computers. Even though Ms. Marchand did not consider herself computer "literate" she was most agreeable to involving all four of her grade seven language arts classes in the collaborative project with the computer teachers.

The Students

Grade 7E, the specific grade seven class chosen for the study, was selected from the five grade seven classes in the school on the basis of the timetable. This class of

twenty-six students was observed in two of their language arts classes dedicated to Writer's Workshop on the first day of the week and then was followed through their four periods of computer class for each of the remaining week days.

Prior to my coming into their computer class they had spent time learning a little bit about the computer and its operating system and then had worked with the typing tutor program *Superkey* for approximately one month. They were just beginning to work with the word processing function of *Appleworks* when I began my observations of their class. In their language arts class they were well on their way to completing at least the first draft of their first Writer's Workshop writing assignment. After spending approximately one week observing them in their computer classes and one day in their language arts class, I administered a student questionnaire to the students.

Because it was not feasible to closely follow all of the students and their experiences with using the computer for writing, I decided to choose three students to study more intensely. Teachers are always faced with teaching students with varying degrees of knowledge and skills in a classroom situation and thus I felt it useful to study the experiences of three students, each with a different starting point in terms of computer knowledge. Through the questionnaire I was able to gather some initial data on the students' perceptions and experiences of language arts and computers. The completed questionnaire also gave me some of the information I required to choose three students to use as key informants in the study.

The three students who were chosen are introduced below according to the information they wrote on the questionnaire. The information provided on each of them reflects their initial perceptions and experiences with computers before beginning to use them extensively for their language arts assignments, although two of these three students had completed the final draft of their first Writer's Workshop assignment on computer.

Jennifer

Jennifer, the student who had the most experience with computers, had been using a computer for approximately four years. She had an Apple IIe and a printer at home. She used her computer at home "off and on" to play games and to use the programs *Printshop*, *Printshop Companion*, and *Appleworks*. Jennifer enjoyed using all these programs and even had her own disk at home with her "own made stuff on it." There was nothing at all about using computers that she disliked. At school, she preferred to work on one of the three Apple IIGS computers because they were new and "neat!" She said, "The Apple IIGS feels way different—the keyboard." Jennifer said that she enjoyed both working alone and with someone else depending on the task. "I like both, because if it's a report, I like to do it by myself, because I get kinda nervous when someone's peering over my shoulder, but I don't mind with games." The extent of her work with using computers for language arts consisted of her just completed first Writer's Workshop assignment: "I have done a nine page story which I did on the computer in school, and finished it at home." She thought that the computer was useful for language arts assignments because "It will make stories look much neater." The most important things she had learned up until this point in computer class were "proper keyboarding" and how to use the underline option in *Appleworks* "and not anything else because I have a computer at home."

Michael

Michael had been using a computer for about one year when he began grade seven. He had very limited access to his brother's Commodore 64 computer and printer at home. At this point he was using the computer at home for some word processing, writing some small programs, and playing games. What he most liked about using the computer was that "They are easy to do writing, for you can type and delete easily. They can save." He had no preference for working alone or with someone, nor did he care what computer he got to use in the classroom. His major concern was that there was not enough time

available in school to complete assignments on the computer. Michael had used the computer at home to write his first language arts story. He felt that the computer was useful for language arts assignments because "You can do it quick and efficiently. It is neat when you use the printer." Computer class this year had taught him "proper keyboarding, using all the fingers." He had also learned how to save and use various options on the Apple computer that were different from the commands he used on the Commodore at home.

Brendan

The least experienced computer user of the three was Brendan. He had only a very brief exposure to using the computer in elementary school for producing some graphics and playing games. He said he had enjoyed making pictures with the computer and now was enjoying using word processing. This year he had learned keyboarding and basically how to run the computer—saving, printing, taking care of the computer and disks. Brendan had no real preference for any kind of computer. He preferred to work "alone, so the ideas are your own," but "sometimes it is nice to have someone to help you." He had not done any of his language arts assignments on computer because he said there was not enough time in school for completing them and he did not have access to a computer at home. He did recognize though that the computer could be useful for language arts assignments because "You can organize paragraphs/sentences and erase at ease. You can save programs on disk." His major complaint about computers was that sometimes the programs did not work properly. "Your work would get erased and you had to write it all over again."

The Researcher

At the time of this study I was a second-year graduate student working on a masters degree. My previous teaching experience included five years of teaching, primarily in the field of English/Language Arts. I had taught one year at the elementary school level, one

year in junior high and three years in senior high school. Computers in English/Language Arts had become of interest to me while I was teaching. Many of my students were using computers to do their writing assignments for my classes. Through my discussions with the students who were utilizing computers for their assignments, I became very interested in the many positive comments they had to say about writing with computers. During my last year of teaching I attended a workshop on word processing with the Apple IIe and began to compose my course outlines and some handouts for students on the computer. I also took some of my grade twelve English classes into the school computer lab to compose their resumés and letters of application. Upon returning to university to pursue a graduate degree, I purchased my own computer, a Macintosh Plus. When I entered the setting of my research study at Woodland School, I had been an avid computer user, at least of the word processing function, for approximately one year.

My role in the study at the school began by meeting with the principal and the teachers who would be involved in the project. The plan for integrating computers into the core subject areas had been made prior to my arrival at the school and my purpose was only to observe in a natural setting what was occurring with one grade seven class who would be using computers to accomplish some of their language arts assignments. In some of the early meetings it appeared that the teachers were looking to me for some direction as to what they could do for specific assignments for implementing computers in the language arts program, or vice versa, but I remained quiet and restated that all I wanted to see was what they did "naturally" with their plans. This particular problem of what the assignments would be was quickly solved by the language arts and computer teachers.

I was introduced to the students by Mr. Cambridge who explained that I would be doing some research in their computer and language arts classes for the next few months. He told the students that I would be observing, questioning and interviewing them about their experiences using the computer to write. Both teachers agreed that I would participate in their classes functioning as an aide to the classroom teacher at times and at other times I

would only observe and record my notes. Initially, I was as ignorant about the technical workings of the particular computer and the word processing program that the students were using as were they. I learned along with them each day as Mr. Cambridge introduced new features of the word processing program. This enabled me to help the students with minor technical problems as I circulated around the classroom observing their behavior. In their language arts classroom I conferenced with the students much the same as their teacher did. As they discovered that I had been a classroom teacher at one time, they came to rely on me more for help in their actual writing and to function as another adult who would respond to their work. Through the course of the study I took on different stances of engaged versus detached observation/participation ranging from conferencing with students about their writing to sitting silently and alone writing my field notes on what was happening around me.

At one point late in the study, the language arts teacher stated that my role was perhaps that of a "catalyst." The teachers had planned to use computers in conjunction with language arts and they perceived my presence to have been instrumental in helping the implementation proceed. When I asked, in my final interview with Ms. Marchand, if she had anything else she would like to say about the experience of the previous three months, she was very honest in stating her initial skepticism about being involved in a research study. She also commented briefly on how I had functioned in the project:

> I think it was one of the best things... I have to admit I thought here comes another person coming in and I thought, no. But as it progressed I suddenly became so aware and really excited about the fact that this is one of the ways that computers can be dealt with.... But I think you being here was a way to focus our attention on it and I'm sure we would have been successful but not to the degree that we were forced to really look at it and share. It was really quite an eye-opener and it was a wonderful experience.

The Tasks

Although the language arts teacher considered herself the least knowledgeable (of the adult participants in the study) about the capabilities the computer might have for her

language arts students, it was she who took the initiative and solved the problem of what the majority of the assignments would be. The teachers had to think about how the computer could most naturally fit into the language arts program that Ms. Marchand had, and not how the language arts program could fit the computer. At the conclusion of the study, Ms. Marchand explained how the problem of assignments was solved:

> **W.M.**: Do you think that eventually the computers quite naturally fit in?
>
> **Ms. Marchand**: I think that was a problem with [two of the other teachers]. They thought, 'What are we going to do?' And I said, 'Listen, with this Writer's Workshop just take in the folders. They sort of looked at me like I was crazy and then in a couple of days everybody's eyes were as big as saucers and the kids were pounding away at the keys and it was extremely successful. So I don't think that there was any problem once we understood where the kids were at.

In keeping with her philosophy of teaching skills and concepts within the framework of students' writing, Ms. Marchand suggested that the assignments the students do on the computer also be a natural part of the students' grade seven language arts program already in progress. They would not be contrived just for the sake of writing on the computer but would be part of the process she had already been using for teaching writing.

Most of the students completed a minimum of three Writer's Workshop assignments over the course of the study. Two of them were on topics freely chosen by the students and one piece of writing was on the theme of "Cities." This topic was assigned by the language arts teacher in an effort to encourage students to write submissions for the school district's publication, *Magpie*. The computer teacher developed a few assignments of his own in order to teach some specific functions of the word processing program and to test the students' skills in particular areas for a report card mark. One final assignment was developed by the two teachers to combine the teaching of two particular language arts skills: 1) using quotation marks and accompanying punctuation and 2) choosing substitutes for the word "said," and to teach two word processing functions: 1) the SEARCH AND REPLACE command and 2) the MOVE command. Samples of all of these assignments can be found in Chapter 4.

Procedures for Data Gathering and Analyzing

The three major data collection procedures employed in this study were: 1) observation 2) interviewing and 3) document analysis. My ethnographic record was adapted from Spradley (1980).

Observation

Following the initial meetings with the principal and the teachers involved in the study I began my observations of the students in both their computer class and a double block of their language arts class. The language arts class was observed on Monday afternoons and the computer classes followed one per day for the remainder of the week. Each single class period was 45 minutes in length. Observation was done free-form. In each class I observed and recorded field notes on: the physical surroundings and the arrangement of physical objects in the space; the behavior, verbatim language, acts, gestures, and the like of the participants; and the events of the classroom and their time and sequence. The field notes were a condensed account of of my observations made in the field. Upon leaving the classroom each day, I expanded these notes to include my personal perceptions and reflections on what I had observed.

I roamed freely amongst the students observing them, helping them with problems, talking with them and asking them questions about what they were doing and how things were going in their writing. At times I would sit in the center of the classroom removed from the students, who were working on the computers around the perimeter of the classroom, and observe the "going on" of the whole class. Students had been instructed by their teacher that I would be available to help them just as he would, but if I was sitting and writing they should not bother me. My role as an aide to the classroom teacher was at times being very involved in participating with students and at other times being strictly an observer. I spent approximately three months, from early October until the Christmas break, in this environment.

Interviewing

In addition to the data gathered while observing the students in their classrooms, I used a second data collection strategy, interviewing. Interviewing was used in three forms: 1) a student questionnaire 2) informal interviews with students and teachers and 3) formal interviews with the three students chosen as key informants and the two teachers participating in the study. Interviewing helped me to uncover personal meanings held by each of the participants and to provide multiple perspectives and insights into the meanings that underlie their behavior.

Student Questionnaire

The following questionnaire was given to the students to complete after I had been in their classes for approximately one week. Its purpose was to learn more about the students' experiences with computers and how they perceived the topic of computers and language arts before they became intensely involved in using word processing for some of their language arts writing. It also provided the information I needed to choose the three students I would focus on during the remainder of the study.

STUDENT QUESTIONNAIRE - COMPUTERS AND LANGUAGE ARTS

NAME - _____

1. a. Do you have a computer at home? ____ YES ____ NO
   b. If YES, do you also have a printer? ____ YES ____ NO
   c. What kinds of things do you do with your computer at home?
2. Do you like using computers? ____ YES ____ NO
   a. What do you like best about using computers?
   b. What do you like least about using computers?
   c. Approximately how long have you been using a computer?
3. Do you prefer to work alone on a computer or with someone else? Why?

4. How often do you use a computer? (e.g. everyday, once a week, etc.)
   a. At home?
   b. In school?
5. Are you satisfied with the amount of time you get to use the computer at home and/or at school? Explain why or why not.
6. a. In school, how do you decide which computer you will use in class?
   b. Does it matter to you which computer you get to use? Explain why or why not.
7. Are you able to use the computers in school at any time other than during computer class? (e.g., after school, noon hour, computer club)
8. What have you done with computers that is related to Language Arts?
9. What computer software programs do you work with?
   a. In school?
   b. At home?
10. How do you think a computer can be useful for Language Arts assignments and activities? Give some examples.

After the students did the questionnaire, I divided the completed questionnaires into three groups: those of students who had a lot of experience with computers (i.e., students who had been using a computer for more than two years and perhaps had access to one at home), those whose experience was relatively limited but had some exposure (i.e., students who had some access to a computer for about one year), and those of students who had very little or no exposure at all to computers (i.e., minimum exposure possibly through games and perhaps a brief experience with computers in elementary school). From each group I chose a couple of candidates who, from their answers on the questionnaire, best fit the criteria outlined above and then in conference with the two teachers involved in the study chose one student from each of the three groups. Besides the aforementioned considerations for choosing the three students, the teachers' considered each student's record of attendance in making the final choices. Academic ability was not a consideration for choice. In an effort to keep the focus of the study on the "natural" experiences and behaviors of the students, the students selected were not cognizant of the fact that they had

been singled out for more intense case study. This decision was made jointly with the teachers. We did not want any of the students to stand out from the rest of the class. All of the parents of the students signed release forms allowing their child to be involved in the study.

Informal Interviews

Informal interviews consisted of brief talks with each of three students who had been chosen as key informants, in the classroom as they did their work. In an effort to maintain a broad perspective of the whole situation, I talked to many of the other students as well. Informal discussions with the two teachers involved in the study were frequent and ongoing throughout. I recorded data from these informal interviews with my observation field notes on a daily basis as they occurred.

Formal Interviews

Formal interviews were held with each of the three students individually twice during the study. The first interview occurred approximately one month after the study began and after each student had completed two Writer's Workshop assignments. The second interview with two of the three key informants was held at the end of the study in December. Due to his illness before Christmas, the third student had to be interviewed in January. In an effort to avoid singling out the three key informants for special attention, interviews were held in a small private office in the school. Students were requested by their teacher to leave the classroom and report to the office. I used some basic questions as well as each students' writing as a general guide for the interviews, but an attempt was made to keep the interviews as conversational as possible.

The language arts teacher and the computer teacher were also formally interviewed in January. This time was more convenient for them than directly at the end of the study before Christmas. Again, I used some basic questions as an interviewing guide, but

generally the interviews followed a more conversational approach in which questions were developed out of the respondents' previous comments. All of the interviews were recorded on tape and were transcribed.

Document Analysis

The final data collection method, document analysis, included any written material available to me and relevant to the topic. The documents collected for this study included as much as possible of the three students' writing done on computer during the duration of the study and the assignments developed by the teachers and administered to the students. The documents were examined in conjunction with the rest of the data collected in an attempt to gain further insights into the experience of students writing on computers in a classroom environment.

All of the information collected through observations, interviews, and documents was gathered together and written into a chronological story. The analysis of the data involved a way of thinking in which I determined the parts, the relationship among the parts, and their relationship to the whole (Spradley, 1980). As I wrote the chronological story, I searched for patterns or categories and discovered the answers to my research questions.

Chapter IV

PRESENTATION OF DATA

The Story Of Grade 7E - Computers and Language Arts

Week 1

Twenty-seven eager students enthusiastically rushed into the computer lab and sat down at the central desks. They waited to hear the teacher call out their birth month so they could get their disk and choose a computer. (Having them get their disks according to the month they were born in was used as a means of allowing for rotation of students between the two different kinds of computers available in the lab, i.e., Apple //e and Apple //GS.) When asked, most of the students didn't really care which computer they got to use, but some had a preference. Most often students chose a computer where they could sit close to their friends or they chose a computer in a specific spot in the classroom which they had grown accustomed to through habit.

After choosing where they would sit, they instantly turned the computers on and loaded their disks into the disk drives. There was no waiting for any instructions from the teacher. For many of the students it was a very methodical process that required little of them, and so as they got their programs working they talked with others around them often about other computer-related things. One discussion amongst four students centered on the "neat" computer and programs of a friend. They wondered how much these other items might cost and made comparisons between what they were now using and this friend's computer and software. For other students the loading procedure still caused concern and they consulted peers sitting next to them. Help was readily given, but not usually through verbal instructions. Rather than telling the student who was having difficulty what to do, the helper would actually reach over and touch the right key. One particular student exhibited her skepticism with the loading procedure by crossing her fingers on both her hands while waiting in anticipation to see if her program had loaded properly. She voiced a

delighted little "Ah ha!" when her screen revealed she had successfully accomplished loading the program.

No languid faces could be seen as the students waited in eager anticipation for further instructions from their teacher. Even though they were told to get the main menu on the screen and then wait, it was not possible for them to wait. Once they reached the main menu they played around with it highlighting each section on the menu using the arrow keys. They approached the computer as a toy that they could play with, to a certain point, without destroying it. Even while listening to their teacher's instructions, many of the students could not help their fingers from hovering above the keys and pretending to touch them as the teacher talked about what they were to do. Accidently, a key would actually be touched and it would emit a beep from the computer and a condemning look from the teacher. It seemed impossible for most of the students to just listen to instructions. They were intensely involved in the keyboard and screen and wanted to duplicate the teacher's instructions as they were being given.

The instruction was on "deleting" and "yanking" text by letter, line, and block. Nothing had been typed onto a file for them to practice on; therefore, it was up to the students to type some text in so that they had something to work with. Most just typed "mumble jumble" so that something existed for them to manipulate. They performed the functions of "deleting" and "yanking," but in a very haphazard fashion as they played with the text as if it were a game. While playing with the text, one student accidently deleted his whole file and enthusiastically exclaimed, "Now I don't have anything to do!" His delight was short-lived when the teacher then instructed the students to add more text to their files. The student quickly recovered by returning to his main menu to start a new file. The adding and deleting of text was fun and impressed the students as the fluidity of making text appear and disappear was very new to them. At this point, they played with the word processor's abilities to make text ephemeral without really realizing the computer's usefulness beyond its toy or game-like appeal.

On the following day the computer teacher quickly realized that in order for the students to learn the functions of the word processor in a meaningful way, they must be given an assignment that was more realistic than just typing anything at all into a file. Mr. Cambridge explained, "One of the major strengths of doing your work on a computer using a word processing program is its ability to edit: Because that's what it's there for. When your language arts teacher returns your writing assignment and tells you to correct your errors, it's very easy to do if it's on computer." Mr. Cambridge's modified assignment required the students to make corrections on the hard (paper) copy of a paragraph called "about me" and then effect the changes on the computer file already on their disks.

Assignment:
about me

Hi this is about me. my name is joe an i go to Woodland schol. thi;s summer i had a terrribl experience when ;i dwas chased by lions,andtigers , anbdother wild animals. after the merry go round stoppped i rode on some other rides. the best movie thet i was called the Lone some cow boy. it i was on tv. this is al no about me. Please give me a good mark cause im a good kid.

The students took a few minutes to make editing marks on their hard copies. The changes they made on the hard copy exhibited many different styles and degrees of editing. Some just circled or underlined every mistake they found, while others made very elaborate notations using standardized editing marks. Still others actually wrote a completely corrected version below the error-filled one. For most, the editing on paper was done very quickly and then they hurried to their computer to start the process of editing on-line. At

this stage, the revisions the students made were in the areas of spelling, punctuation and mechanics, not in the content of the paragraph.

The initial loading of disks and reaching the appropriate file to work on took considerably less time than just a day before. For those still having difficulties, their peers quickly reached over and touched the keys that got the program working correctly. The teacher had become their second source of help; he was called upon only after the individual student or a neighboring student could not get the program to work. The teacher himself recognized this increased student interaction in the computer lab as compared to when he taught the same students mathematics. He said that "in math, basically I expect them to be working on their own and if they have any troubles they come to see me. In computers the same thing; however, quite often there are so many people running into trouble at the same time that they turn to the person beside them and that's quite all right. Or someone will be finished first and I sometimes say you can help someone who's having difficulty so it frees me to spend more time with someone who is even in more serious trouble."

The atmosphere in the classroom today had quickly changed from yesterday's mood of playfulness to one of seriousness. The computer was no longer a toy to be played with but had become a tool being used to get a job done. A very concentrated effort was being exerted by all students as they methodically attempted to use correct keyboarding skills to make corrections in the text. Inconsistencies between a typewriter and the computer were quickly realized as students tried to use the space bar instead of the arrow keys to move forward in text already written. This procedure only added spaces and created frustration. Students used a variety of methods for deleting and adding letters and encountered many problems deleting text. Through trial and error they soon found that cursor placement was the integral factor when deleting text.

The approaches to editing varied as students each adopted a very personal style for making corrections on their files. Some began with trying to center the title, while for

others title-centering was not even a consideration. Within the group of those who attempted to center their title first, a variety of methods were used. One student just moved the text over using the space bar until it "looked" centered. Another student saw that her page was 60 columns wide and so she divided it by two, found the middle and then started typing her title. Through trial-and-error and common sense, many students were able to achieve what they desired, although perhaps, their methods were not the simplest nor most advantageous means of doing something on the computer. Most students showed creative thought and no hesitancy to try out things before asking their teacher or someone else for help. Those who were a little more hesitant were often encouraged to attempt something by the helping hands of their neighbor.

Two students, unaware of the word processor's benefits of editing only those sections you wanted to, erased the whole file and started writing the paragraph over again from scratch. They said they didn't like working with the piece of writing that was full of mistakes and that starting "fresh again" would be much faster than trying to edit the existing paragraph. Interestingly, the two students who chose to re-type the complete assignment did not get nearly as far into the assignment as the students who chose to revise the text as it existed on the screen. It was surprising to see how much time it took for the students to effect revisions in a very short paragraph that didn't even require much typing on their part. Most just barely completed the assignment as the class period ended for the day. Actually watching the editing process in action, without the laborious and tedious recopying required when handwriting, made me see how much time it really took for students to revise a previously written text that was on computer.

As students completed the "about me" assignment, their teacher reminded them that it was only a revised version of the initial paragraph and that they should get a new printout of it and perhaps do further revisions before considering it as a final copy. He proceeded to give them a printer demonstration, so those who were ready to could go ahead. When the demonstration would not work initially, the students were more than willing to offer

solutions for the problem: "Have you got the printer turned on? Is the computer plugged in?" Just as if they were one-to-one on their own computer, they went through a process of elimination trying to help Mr. Cambridge find the problem. The students listened attentively to the new information regarding printing, but quickly ran for their computers when the demonstration was over. The demonstration of how to use the printer took five minutes and the students were easily able to carry out the function independently when they were ready to. The actual teaching of the computer functions took very little class time as the students caught on quickly when they had a need for the particular function. The discussion heard among students now related more to problems with spelling and punctuation, and less with the technical workings of the computer, as they quickly mastered each new computer function.

For most students the loading of the word-processing program was taking less time each day and they were happy to hear their computers start up for another day of work: "Oh I like that sound! It sounds like it's ready to start working." One of the students, Adriana, was the first to complete her editing changes and be ready to make her printout. Very easily and quickly she followed the instructions that had been given by her teacher earlier and she successfully got a printout of her file. She watched as the printer printed out her work. Most pleased with the result, "Oh, it looks so good!", she went off to show her computer teacher what she had done. When it came time for others to print their work, most did so as easily as had Adriana. Even though the lab was equipped with three printers, students spent time waiting in line to make their printouts. This procedure did not create any problems as the students waiting to use the printer were involved, if needed, in helping those using it. They were also intrigued with reading each printout as it was produced. I was concerned about the public nature of such a situation imposing on the traditionally private world of writing-in-process, but the students showed no opposition to it at all. In fact, most of them appreciated the concern and advice they got from their peers about changes they should make in their next draft.

Although many students after reading their printouts decided to make more changes in their "about me" assignments, most of the editing was done only in the areas of mechanics, spelling, and punctuation. A few of the students decided to make the paragraph really "about them" as well and returned to their files to make more content level changes and to add more information. Those who had finished with the "about me" assignment quite naturally moved into opening a file for writing stories or a journal. Adriana had come prepared with her language arts homework. She was writing a report on "Fashions" and had decided to do it on the computer because as she said, "It looks much neater when it's typed and it makes it easy to put my pictures into the report." Within one class period, she had already made one printout of her report and was revising on-line making changes especially in the area of word choice.

Week 2

I had observed the grade sevens in their computer class for one week before going into their language arts classroom for the first time. They were working on their first Writer's Workshop assignment. The teacher surveyed their assignments to see what draft they were presently working on and then they went to work on their own. As some of the students conferenced with each other, I had the opportunity to listen and ask them questions about their writing. I listened to Tanya and Adriana as they discussed what they had considered to be their final copies of their first piece of writing. Tanya had used her uncle's typewriter to do her final draft. She said she wanted to use the computer but her uncle was using it at the time. The computer would have given her a much neater copy with no mistakes and no "white out." She felt that had she used the computer, further changes would be easy to make because she wouldn't have to re-type the whole thing again. As Adriana read Tanya's story, Tanya commented that she hoped there wouldn't be so many mistakes that she would have to type it all over again because "That would be a lot

of work!" Tanya looked quite uncomfortable as she and Adriana penciled in many mistakes.

In contrast, as they discussed Adriana's report on "Fashions", Adriana was quite concerned that they find all the errors they could because she was going to do another draft. In fact, she had already started on it since she had made the printout they were presently going over. Errors for Adriana were something to be found and corrected, whereas for Tanya, they caused anxiety because it meant much more time would need to be spent typing. After conferencing with her teacher, Tanya found that she would have some major changes to make in the organization of her story. Even though she would have to re-type it, she was glad she typed it initially because "It's really easy to find my mistakes in the typed copy." She wished that her uncle had not been using the computer at the time she wanted to use it before.

Shannon sat in her desk carefully writing her second draft. She said she didn't really mind writing draft after draft because each time she rewrote it she said she found places "to add words and change things to make my story sound better." Her comment made me stop and think whether there are benefits to rewriting each and every word which might be lost through revising on computer. Shannon said she preferred writing by hand because she liked her own handwriting. She knew that the computer could make changes more easily, but she didn't have access to a computer at home where she did a lot of her writing and so anything she did on computer must be done in school time. I wondered if we were creating another class distinction between those students who have computers at home and those who do not.

Another student was laboriously printing her second draft by hand. When I asked her if she preferred to print, she said no. She felt printing was much slower than cursive writing, but her previous teacher said they should print their stories and thus she continued to do so even though her present language arts teacher hadn't told her to. She said, for her, typing her story on the computer would also be very slow, but much faster than the

printing she was doing now, and at least any mistakes she made could be easily changed and would not make a mess on her paper. Even though she recognized the benefit of using the computer, she continued to employ the writing process she felt most comfortable with.

Jennifer's story was nine handwritten pages long. She had completed the first draft of her story and thought she might do her next draft on the computer or on the typewriter because "It's like a book and I want to put it in book format, like printed out." She was the first of many students to comment on how a typed copy or computer printout somehow made their writing more like "real" writing. The "look" of their work seemed to change their attitude from that of 'student writing for a teacher' to that of 'a real writer writing for a wider audience.' She recognized all the benefits of using the computer (it saved her work, it made changes easily, it gave her a neat printout) but still wasn't sure she would write her story on computer because she felt she was a pretty slow typist. She had never done more than two drafts of any piece of writing and didn't expect to have to now either; therefore, she wasn't sure if it would be worth the time she would spend to type it into the computer.

As I walked around the classroom I saw students who were struggling with just getting a first draft written. I considered that perhaps because of the inefficiency with keyboarding of most grade seven students, that they should write their very first draft by hand—the thinking draft—where they could focus on what they were writing first and foremost and not on how to type. From talking with the students, it was evident that the grade sevens already realized the benefits of using computers for writing even though the majority of them had not done so yet and others were undecided about the need to. The other thing made clear to me as I talked to the students who were now offered an option to writing their stories by hand was the idiosyncratic nature of the writing process—even just the personal preference for the technical aspect of printing, typing, word processing, or handwriting the actual text.

In computer class the next day many students appeared to be nearly finished with their "about me" stories and asked Mr. Cambridge how to add more files to their disks to

begin new stories. None of them seemed to be bored with what they had written in the "about me" file even though they had been adding to it, changing it, and printing it for about five class periods. Those who felt they had finished had chosen to go on to write "new stories" about almost everything from their favorite music groups to this week's spelling unit assignment. Adriana continued to work on her "Fashion" report replacing all the uses of the word "nice" with more descriptive ones on the advice of her language arts teacher. She had to run to the language arts classroom to find a thesaurus. In doing her report, she had found a need for learning how to do a page break. After being shown only once by her teacher, she felt she had mastered it: "It's easy. I've memorized how to do it. This is my fourth new page!" Most of the students began new files doing some kind of language arts related work without being told to and without having a specific assignment to do. I suppose that it was quite a natural thing to do because all a word processor can really do is manipulate text. Therefore, to do anything with it, one must write!

A perceived problem envisioned by two of the school's computer teachers,"How are we going to integrate writing from the language arts classroom into our computer class?" had partially solved itself just through the nature of what a word processor is capable of doing. The language arts teacher herself provided "assignments" or a "program" for writing with computers through the Writer's Workshop approach already in place in her classroom. She suggested, "With this Writer's Workshop, just take in their writing folders. They (the two computer teachers) sort of looked at me like I was crazy and then in a couple of days everybody's eyes were as big as saucers and the kids were pounding away at the keys and it was extremely successful. I don't think there was any problem once we understood where the kids were at." The students' language arts writing folders were brought into the computer lab for each class and set on the front table for their use if they chose to go to them. The process approach to writing used in the language arts classroom determined how the computer would be used—the technology was brought to the program, rather than the program to the technology.

Once the students began to write for their own purposes, they discovered things that they needed to learn how to do and so the computer teacher would demonstrate these functions for the whole class. Some of these things included how to center certain portions of their text, such as the title, and how to left and right justify their margins. This new information prompted further exploration by Tanya who wanted to underline her title. The girl sitting next to her was skeptical that it was even possible for the computer to underline because when she had tried to do so using the dash [-] key, all she could get were dashes or underscoring between letters, not underlining. Tanya was undaunted by Anne's experience and went into the options menu. Both girls were very excited when they successfully figured out one way it could be done through their own exploration. "Oh wow is that ever neat! Now I can see that it can be done!" Even though their method of underlining was not the easiest way to do it on the computer, as pointed out by the teacher later, initially they had solved their own problem.

Jennifer, having finished with her "about me" story, had decided to type her nine-page Writer's Workshop story into the computer. She worked very intently until the bell rang and then ran to ask Mr. Cambridge if she could take her disk home to work on her story. She informed him that she had Appleworks at home and a printer, too. He allowed her to take her disk home if she promised to make sure she returned with it the next day. Jennifer did finish her story at home on the computer with a little help from her dad. She said it took her a long time to type it in, so he did a bit of the typing for her. She also informed her computer teacher and me that by typing her story, "It shrunk! It's so much shorter." Her previous nine pages of handwriting was now only five pages of printout. Adriana was also astonished at how her many pages of handwriting on her "Fashions" report had become so few when printed off the computer. Even so, both girls were very pleased with the appearance of their Writer's Workshop assignments.

The ease with which Jennifer could continue at home the work she started on computer at school made her time at school more valuable than it was for someone like

Michael. He too had a computer at home, but it was not compatible with the school computers. Changing from the Commodore computer at home to using the Apple at school was only "a little frustrating" for Michael because of the different commands for performing certain functions. Mostly though, it just meant that he could not carry over his on-line writing between home and school. Most of the writing he did in school had to be re-typed at home.

Week 3

Ms. Marchand, the language arts teacher, introduced a new topic for Writer's Workshop with a focus on publication. The theme was "Our City" and the stories or poems written by the students would be entered for possible printing in *Magpie*, the school board's production of student work. The class brainstormed for ideas on the topic and talked about the importance of using different points of view when writing. This "Cities" assignment was to be the first Writer's Workshop assignment that the students might start writing on the computer from the beginning, if they chose to, since the class was beginning a new cycle in their Writer's Workshop. Ms. Marchand also briefly commented on the grade seven students' first Writer's Workshop assignment that they handed in the previous day and reminded them that if they were going to type their work on the computer or typewriter they must allow themselves a little more time than if they chose to hand write it. She cautioned them to be aware of needless and numerous typographical errors. Students' keyboarding skills were improving, but it was an area both they and their language arts teacher were concerned about: the students because of their lack of speed and the teacher because of the number of typographical mistakes.

With the new Writer's Workshop assignment fresh in their minds, most students came to their computer class ready to work on their "Cities" assignment and the atmosphere in the room was one of quiet and intense concentration on the writing. This was the first time that most of the students realized that they could actually write their first drafts right on

the computer with only their brainstorming ideas or story beginnings from yesterday in their writing folders. The computer had become an alternate writing instrument even for their first drafts rather than just a glorified typewriter with many fancy formatting features used to enhance their final copy. I observed that many of the students had written more during this one period in the computer lab than ever before. Perhaps they could think/write directly on the computer as their typing and computer skills improved and were no longer the major focus as they wrote!

Jennifer was happy to be back working on the Apple //GS, her "favorite computer with the nice keyboard." During the brainstorming session in language arts she had decided to write a story in the persona of Lady Diana. She was writing it as she said "off the top of her head" directly onto the computer. She commented that as she wrote her "Cities" story on-line she just "wrote and typed at the same time." She said, "For stories, I feel that I can write them better on the computer. It's easy just to type right out of my head. It just pops into my head, all these weird ideas and it's fun just to type them. It's easier to type things when they pop into your head than to write them on paper because you can see them on the screen." Where there had been a separation before between the actual writing of the story and the typing of the story, she was now beginning to see it as one process—typing <u>was</u> writing. Her keyboarding skills were quite accurate and within the period she had written a couple of screens of her story.

She continued to write her story in the next day's computer class adding her story title and a few more screens of text. When her neighbor suggested she center her title and underline it, she told her that she could do all of that later and that she just wanted to "write" for now. She took a break to see what Anne was doing next to her and found her playing with the cursor moving it quickly up and down the screen using the arrow keys. Jennifer stopped to try it on her own and commented that it moved much faster going up than coming down and then went back to her writing.

Writing on the computer is more "public" than writing on paper and so it allowed me to see more clearly the great variety in how writer's actually write. For example, Michael's writing contrasted sharply with Jennifer's. Michael sat in the "thinker's position," very slowly and thoughtfully typing with one hand his "Cities" story. He carefully wrote the title first, centered it, and underlined it. He wrote very deliberately adding one word, at the most one phrase, at a time. The body of his text was both left and right justified as it was entered. He liked to format his text as he wrote it, whereas Jennifer left "all of that" until the end. He felt the formatting added to his writing because "it made it easier to work with and to read when you could justify your margins, center and underline words, and make spaces in between paragraphs." The novelty of making one's text "look good" was dealt with at different times in the writing process by different writers. Michael silently reread each sentence as he went, made some more changes and then after a major pause, that followed the completion of each sentence, checked to see what kind of progress Brendan had made before going on to his next sentence. His neighbor, Paul, interrupted him for help, which Michael readily gave and then went back to his writing. Interruptions did not bother his writing process and even seemed to be a desired part of it as he took a mental break after almost each sentence he added. In comparison, Jennifer preferred to sit at the computers where there would only be two people beside her. She would converse with those next to her, but generally just worked continuously and non-stop when she was writing her stories. I wouldn't attribute this difference in writing styles to the fact that they were writing on computer, however, the act of writing on the computer made it more easily visible. It must be noted though that the novelty of formatting made possible by the word processor was a new consideration in the writing process of each writer.

Brendan's writing style combined features of both Michael's and Jennifer's writing styles. Having chosen to write a poem for his "Cities" assignment, he formatted the options to center everything he wrote down the middle of the page. He said he was not too

concerned about the particular words he wrote but would change them to more appropriate ones later. He just wanted to get his ideas down first. Brendan worked diligently until the end of the period. He and Michael stayed after school to make printouts of their work-in-progress. They were a little upset because they ripped their printouts trying to remove them from the printer but quickly laughed because they remembered that this was not a final copy even though it "looked really good." Does the fact that the printout looks so good each time dissuade or encourage writers from doing further drafts? It took these boys a minute to realize that one torn printout wasn't the end of the world.

I stayed after school with the computer teacher to watch the students finish their printouts. The language arts teacher came in and so did many other grade seven students from the other language arts classes who were also using computers. They too wanted to get printouts of their work in progress. The two teachers talked about how this project had created "monsters" because the students wanted more access to the computer outside of class time. Ms. Marchand said that the computer was now seen as a tool by them, not just a novelty. It served a real purpose for them in their writing. Mr. Cambridge had noticed that students had become more positive about computers and computer class: "Students aren't fighting the assignments anymore. They look forward to coming to computer class and they enjoy it and, therefore, I enjoy it." Up until this discussion, I thought that perhaps the students were just working so intently on their language arts assignments in the computer lab because it gave them extra time in school to get their work from another class done. Not so. They even wanted to stay after school in order to use the computers for their writing. The fact that the Writer's Workshop assignments were ongoing with a fairly distant deadline also made me realize that the students were really enjoying using the computers—for writing! Mr. Cambridge concluded the discussion saying that it was time to hire a full-time aide to run the computer lab so that students could have more access to it outside regular class time.

Week 4

An organizational problem became evident in the language arts class when students who had been doing their writing on the computer came to Writer's Workshop without a hard copy of their work to conference with and continue working on. Jennifer was one such student. She remembered where she had stopped on her story written on the computer and continued to write from there by hand. She said she would just type this section into the computer later. Ms. Marchand informed the class that their stories could not be more than two pages long. Jennifer giggled and told me that didn't matter because she was doing her story on computer and when typed "It shrinks. The computer makes it shorter." Jennifer likes to write long stories! She wrote slowly and when I asked her if there was a problem she stated that she would prefer to just write her story straight on the computer. Handwriting it first just wasted time because she would have to type it in later. Her comment made it clear that it had not taken her very long to realize that although the initial time it took to write on the computer might be longer than handwriting, the long term gain of not having to recopy was worth it.

Brendan made a printout of his poem-in-progress to bring to language arts class. He worked on this hard copy adding, deleting, revising, and counting syllables. He commented that his handwriting looked pretty messy next to the typed words, but in his next computer class he could easily effect the changes made today and reprint it. In my first interview with Brendan he said he preferred to work alone at the computer because then "all your ideas were your own." He now found it difficult to stay in his desk across the room from Michael and not share his work in progress as was possible in the computer room where they sat side by side. Just as he finished his writing for the day he quickly passed it along to Michael to read. When I later asked him whether or not the computer had changed how he felt about writing, one of his major comments was that using the computer to write "made writing more fun." He stated: "When I wrote on the computer I talked more with the people around me because people could look at the writing on the screen and

we could discuss it. Discussing it helped me to write better sentences and choose better words." The collaborative and sharing atmosphere that developed in the computer lab while students wrote had become a part of some students' writing process. Being allowed to share their writing and conference on it in the language arts classroom was limited to certain times and some students found it difficult not to share whenever they felt like it.

Michael's slow and deliberate manner of writing on computer was unchanged in the language arts classroom where he experienced a very difficult time getting going on his writing. He came prepared with a hard copy of what he had accomplished so far but couldn't seem to add anything to it. He commented to his teacher that he would rather compose at the computer than write with pen and paper at a desk. He said it was "easier and lazier" to write on the computer. Michael preferred to use the computer because it made writing "less like work" than when he wrote by hand. He had very poor handwriting; so poor that even he could not read what he had written at times.

Ms. Marchand mentioned how beneficial the computer was for students like Michael:

> Kids who have trouble with their handwriting suddenly make their work much more presentable. Quite often when we as teachers look at work that's hard to read we tend to leave it and say, 'that's okay' and just give it 'some sort of an evaluation.' But when we can see it and it's really clear, then kids like Michael pop out. I wouldn't have been able to read Michael's work as easily had it been handwritten. It gives them a much greater chance to get more of their ideas down more quickly because it's all there when they type it. It's way, way easier for them to draft and to do other copies and it's not as laborious. It becomes a fun thing to write. They can share and think at the same time as they write. It's so much faster and it's so much more efficient for them. It becomes a joy instead of a 'God I have to write' painful sort of process.

Although the language arts teacher recognized the many benefits of writing on-line, the preference for writing on the computer by students like Michael adds to the traditional concern teachers have for those students who "just can't write in school" and much prefer to write at home. What Michael did get done in the present class was one paragraph hand-printed underneath what he had done on the computer printout. At each opportunity, he

and Brendan conferred on their writing and made suggestions for improvements. Following these short interruptions, Michael seemed to be able to add more to his writing than when he just sat on his own. Talking to another person about the stories they both were involved in writing, helped Michael "get ideas and advice" about what to write next.

Michael said that he would like to use the computer to do all of his language arts assignments, but some of the work must be done in school where he did not always have access to a computer. Therefore, he had to handwrite most of his work. His decision of whether or not to use the computer for his first draft or for future ones was determined not only by how much time he might have to do the assignment, or the length of the piece of work, but also by how things went when he sat down to write:

> Some things I write right on the computer. If I try it on a piece of paper first and I can't think at all, then I write on the computer. Sometimes it's easier to write and think it right into the computer. Usually I get ideas first and write them down really fast onto paper and then I sort it out when I do it on the computer. The computer has helped me because it's hard for me to write. Not just my handwriting, it's just hard to think. It takes a lot of time. Just sitting there looking at the screen, it usually gives me ideas and I start writing.

Even though he had access to a computer at home and some of the time at school, using it as a writing instrument had not yet become second nature to him. Sometimes he said he just forgot that the computer was even there: "Like for my ballad. I would have done it on the computer but I kind of forgot about the computer being there." Both Michael and Jennifer talked about how much easier it was to "think/write right on to the computer" but could not articulate why it was so.

Organizational problems again became evident when Ms. Marchand wanted the students' "good" rough copies tomorrow but had to extend her due date because many of the students required at least one more day on computer to add what they handwrote and to make a printout for her. As with the problem mentioned earlier about students coming to language arts class without hard copy, new concerns developed with the introduction of the computer into the language arts students' writing process. The organization and scheduling

of when assignments were to be due required more careful consideration. A new concern of what to do with the students who preferred to write on computer and now found it most difficult to write by hand evolved. Finally, the problem of how to deal with the collaborative environment fostered in the computer lab that may not always be possible in the regular classroom had to be considered.

In computer class in week four, students were told that they would be involved in a practical computer exam designed by their teacher to test their ability to perform basic computer operating system functions and the word-processing functions they had learned so far. Some students set aside their writing to practice for the test, while others continued working on their writing. Brendan was very intent on effecting the changes he made to his poem in language arts on his computer file. He quickly got his disks, loaded them and then checked his watch to see how much time he had to work before the bell rang. From his hard copy, he first made changes to what was already on his disk and then added the new text he had written by hand the day before in language arts class. He had the centering option engaged and he was pleased to see the shape his poem took as the computer centered all his lines down the middle of the page in a distinct form. He was totally engrossed in his own work and worked non-stop for the whole period. While watching his work print out, he noticed a line in his poem that he had forgotten to change and was quite upset with himself because the bell had rung and he was running out of time. He ran over to Mr.Cambridge to see if he would stay late so that he could fix the error and reprint it. With the approval of the teacher, Brendan stayed after school to correct his mistake.

Jennifer was also busy adding to her story that which she had written by hand in language arts class. She was not as hurried as Brendan because she knew what she didn't finish she could do at home. The fact that she had a computer compatible with the ones at school made it very easy for her to take her incomplete work home. She was able to finish her work in class though and queried whether or not she should do some formatting, such as justifying the margins, but decided not to because it was "just a working copy" and the

formatting could be done later. She printed out her story and then went back to her computer to practice for her computer test.

Michael abandoned his writing in favor of practicing for his computer test. He carefully went over again and again the functions he would have to perform on the test. About half way through the period he became bored with what he was doing. He looked over at Brendan and decided not to bother him and instead went to one of the Apple //GS computers to see if he could get it to work (others had been unsuccessful in getting these computers to work this day).

The following day Mr. Cambridge assigned a computer test for the students to work on.

COMPUTER TEST

1. Load the file "your life".
2. Add the title "your life". The title must be: centered, capitalized, and underlined.
3. Justify the story.
4. Delete the paragraph that begins "Mary had a little..."
5. In paragraph one change the spelling of "marke" to "make".
6. Add the following as paragraph two: Not all trips go just the way we plan them. We may have some unexpected difficulties such as flat tires, lost luggage or bad weather.
7. After the words "corrected by" add your name and class, e.g. Joe Smuck 7F.
8. Change file name to your name and save it.
9. Print the new file.

Students were to work independently and the test was to be completed by the end of the period. The classroom was very quiet as the students worked to complete the test

before their time was up. Mr. Cambridge would answer no questions. The collaborative climate that was established in previous computer classes made today's class very difficult for many students. They wanted so much to ask their neighbor for help or to offer help when they saw someone next to them having difficulty. Michael and Brendan sat next to one another as usual and found it impossible not to whisper at least about their frustrations. Michael, having a problem trying to center his title, became very frustrated as he repeatedly poked at the keys harder and harder without anything happening. Brendan quietly suggested to him that he just do the other parts of the test first and leave the problem areas for later. He too was having trouble making the text justify and center but continued on to make the rest of the changes, additions, and deletions. On Brendan's advice, Michael went on to complete his test and then went back to the centering problem. After both of them repeatedly tried with no success to get the title to center, they went off to print their files hoping that perhaps magically the title would be centered when it was printed even though the screen didn't show it that way. The printout did not show the title centered and so the boys returned to their computers to try again. Brendan tried to center his title manually with his fingers up on the screen measuring for equal space on each side. Michael laughed at him and told him he didn't think it would work.

Jennifer was one of the first students finished and said it was "easy" as she prepared to print. Dissatisfied with the resulting printout, she returned to her computer to make more changes. Two more repetitions of printing and changing and she still had an error when her time ran out and the class was over. She was very disappointed as she left for the day. Other students in the class experienced both joy or frustration as they achieved success or failure in the test. Because they were able to see the results of their work instantly, the students returned to their individual computers and made changes until time ran out. Mr. Cambridge commented as the students left for the day that he was surprised at how they wouldn't settle for less than perfection. In any other class, and especially on a test, they would do what they could, hand it in, and that would be the end of it. This

emphasis on mastery by the students could be considered positive as they strived for perfection, but it also made me wonder at what point something done on computer is "finished". I speak from my own experience where only time limits me from further changes. Can one actually over-edit?

The following day the teacher explained to the students why they couldn't get their title to center, the most prevalent problem, but otherwise said he was pleased with the results on the test. Even though the test was marked, many of the students returned to their "your life" files, corrected the errors they made, and printed out a new copy of the file. Jennifer had found out from her dad what she had done wrong in her test and she quickly fixed her file. Brendan and Michael said they felt really stupid about their mistakes and readily went off to correct them. Mr. Cambridge again commented on how unusual this was for a testing situation. Few students after a typical test would even write the correct answers down when they were given to them in class, yet here students were actively correcting their errors without any suggestion at all from the teacher.

The computer test was over and since Ms. Marchand had read and commented on the first draft of the "Cities" assignment, the students were busy working on their second drafts. Those who wrote on computer to begin with quickly did their revisions while others typed in their second draft. Brendan made his revisions and commented on how fast and easy it was to do. He considered his handwriting "pretty messy" and difficult to read sometimes. He commented that the printout looked really good and it was easier to find mistakes in it. The computer served to objectify his work for him: "My handwriting sometimes gets all crammed together. It's my writing and I know what I was trying to write, so it looks the same to me even if I left out a letter or something. But on the computer it looks way different if I left something out. You can really see it because it stands out. With the computer it's a lot more organized." Brendan only spoke of how the computer made editing errors "stand out," leaving me wondering if it helped him as a writer to be more objective when considering other types of revisions as well. As his poem

printed out again he saw another change he wanted to make and so returned to his computer and then back again to the printer. He told me he tried when using the computer for his writing "to get it all correct" before he handed it in.

Michael worked on a story, in which he used this week's spelling words, that he had to do for tomorrow's language arts class because his "Cities" story was done on the Commodore computer at home which wasn't compatible with the Apple //e. He said he would do his revisions on the computer on the Commodore. Michael's situation addresses a common question asked by parents wanting to know what kind of computer to buy their children for home—should it be compatible with what they use at school? Except for Michael, most of the students were so busy with their Writer's Workshop "Cities" assignments that the teacher had to repeatedly tell them that it was time to go home for the day.

Week 5

Over the weekend Ms. Marchand had marked the grade seven students' first Writer's Workshop assignments and today voiced her concern that many of the typed and computer printout products had far too many typographical errors in them, but even so, she appreciated how much easier it was for her to read them than some of the handwritten pieces. Michael mentioned that perhaps those students using computers should employ the use of a spell checking program to help flag needless spelling errors. The teacher said she knew very little about such programs but thought it would be a good idea to look into. The students were then informed that they were to make another draft of this first Writer's Workshop assignment so that it could be displayed on the bulletin board. That meant recopying their writing minus her comments and marks and effecting the corrections she had noted on their papers. This new copy would be their polished and published draft—their final draft!

When Ms. Marchand stated that students would have to make another copy of their writing, many groaned at the thought of rewriting it one more time. Jennifer said it was no problem. She said there was "a real advantage" to having spent all that time initially typing in her nine-page story because she could now return to her computer and make the changes indicated on her paper in a matter of minutes. She had to use the computer to make the changes and thus for the rest of the class period while many of her peers were recopying their first stories, she was busy making the scenic title page that was to be the cover of her published story. Her published copy of "The Birch Bark Canoe" was the fourth draft. She was quite amazed that she had actually done more than a "good" and a "rough" copy.

Prior to handing in the third draft of his first Writer's Workshop story, Brendan had taken the handwritten second draft and typed it into his cousin's Macintosh computer. He made two printouts on the Macintosh, correcting and making revisions from the first to the second. By the time Brendan's first Writer's Workshop story was published on the class bulletin board, he had made four drafts of it—two handwritten and two on the computer. It took longer than if he had re-written it by hand because he "didn't know where the all the keys were" and he "added a lot more stuff into the story" as he typed it on the computer. As well as making a number of mechanical corrections, he had made use of the Macintosh's formatting features such as using "shadow" print for the subdivision titles of his story. He said it was "fun to play around with the words. With the Macintosh you could have different letters for different occasions if you needed it to be fancy—to make a word stand out more or something like that. Especially like titles or for different people when they were talking in a story." He had tried to do some of this on his handwritten copy by using red and blue ink for different characters and by printing some portions of his text and handwriting others. His language arts teacher advised him to use only blue ink on his handwritten draft, but didn't mind the variety in fonts in the computer printout. The Macintosh's ability to play with how words "looked" intrigued Brendan. Although the Apples at school could not perform such elaborate formatting as the Macintosh, all the

students emphasized how good their writing "looked" when printed out. Brendan told Mr. Cambridge how the Macintosh was able to print different fonts and in different sizes and this prompted Mr. Cambridge to give a demonstration on how to change the print size (characters per inch) with the Apple.

Although all students went through at least three drafts of their writing, it appeared that those who had done it on the computer (even only the last two drafts) were not as adverse to making corrections in their writing. Even after it had been marked and was only being recopied for publication purposes, they readily and without complaint went about making another draft. The fact that Ms. Marchand required them to take their writing to a final published version was a key factor in the students' realization of the usefulness of the word processor. If they were not required to make the final error-free version, would they have been as enthusiastic about the merits of the word processor? Considering the way many of the students corrected their computer test previously, one might speculate that they would return to their writing on computers and do revisions not required of them by their teacher. It would be most interesting to see what would happen!

The language arts teacher commented on many students' first Writer's Workshop assignments that they needed to use "good format" on their writings and that included learning how to correctly "TAB" sections of their work, such as letter headings; stanzas in poems; their name, class, and date on their assignments. As a result, Mr. Cambridge designed an exercise for learning to "TAB."

TABS EXERCISE

Tab stops allow a person to move the cursor across the page to a pre-determined spot. When you boot Apple Works the tabs are set every 5 spaces as indicated by the vertical lines across the top of the REVIEW/ADD/CHANGE screen. To change the settings hold down the

O-A key and press T. At the bottom of the screen you will see "S:Set C:Clear R:Remove All." Press R and all the tabs are removed. Move your cursor to the column you want (watch the column counter at the bottom) and then press C, if you put in a tab at the wrong place you can remove it without removing other tabs by putting the cursor on it and pressing C.

To practice this you are to key in the Science question that follows. First remove all tabs and then set one at column 10 where you will start the numbering and another one at column 40 where you will start the lettered responses. This file is to be known as "Tabs" and will be saved under that name. When you key it in you will press return twice after the sentence ". . . in the second group." To move to the spot where you start 1, you press the "TAB" key once. Put two spaces after the period that follows each number and each letter. After "red blood cells", and after each of the numbered statements, press the "TAB" key again. After "message", and after each of the lettered statements, press return.

Match the words in the first group with the words in the second group.

1. red blood cells	a. message
2. nerve cells	b. destroy germs
3. platelets	c. carry oxygen
4. white blood cells	d. help in clotting
5. impulse	e. longest cell

WHEN YOU HAVE FINISHED CALL YOUR TEACHER OVER AND SHOW OFF YOUR FINE WORK!

Michael and Brendan worked collaboratively on the "TAB" exercise and found it quite easy to do, except Brendan's "disappeared" on him when he went to save it and so he had to do it over again. Jennifer worked on her "TAB" exercise for the whole period. She and many others thought they had to get the correct answers to the exercise as well as format it. Working with the girl next to her, she consulted a dictionary and tried to determine the correct answers even after Mr. Cambridge said that they need not do so.

Many of the students asked if they could continue working on their Writer's Workshop assignments. What they had started earlier was more important to them than an exercise to learn a new word-processing function. When I asked them why they were spending such a great amount of time typing their final draft of their Writer's Workshop work, they told me they wanted it "to look good when Ms. Marchand put it up on the bulletin board." They thought that a printout looked much neater and better than even their best handwriting. This extra effort of typing, when most of the students are novice typists, was an indication of how important students felt it was that their work "look good" and that a computer printout could achieve this for them.

As students completed their "TAB" exercise and their Writer's Workshop assignments and found themselves with nothing to do, many of them automatically started a new file and began writing a new story or poem. Brendan, Anne and Anil worked collaboratively at one computer writing a funny story. They conversed and laughed as they added to their developing story. Jennifer and Tanya each started a story on their own computer screens. They alternated between computers each adding a sentence or two to the other story before they switched computers. Adriana worked at formulating a questionnaire to have her friends answer. Michael experimented with making different printouts of some of his files by changing the characters per inch in the option menu. Michelle spent her time typing her spelling story onto the computer. She said she wanted to practice her typing skills and to correct the errors she had made in her original

handwritten story. Using the underline option she was able "to show off" the week's spelling words. Most students easily found something else to do without being told to or without having a particular assignment. I found this an interesting development since barely a month ago they could only play with the computer like a toy when they didn't have any set text to manipulate while practicing the "DELETE" and "YANK" functions. By combining the word processor's ability to easily manipulate text with their natural ability to write stories, the students instinctively turned to writing to fill their extra time in the computer lab. It would be interesting to see what they might do if they had access to other programs besides the word processing feature of Appleworks.

Week 6

The published final drafts of the students' first Writer's Workshop assignment were exhibited on the language arts classroom bulletin boards. Ms. Marchand talked to me about how pleased she was with the work the students had done and especially that which was done on computer. It was neat and easy for her to read; students easily found and corrected their mistakes; and she felt the students were really working as writers, revising and editing what they wrote. She thought that they spent more time "really writing" rather than just recopying. Brendan's comments to me indicated that her assumptions were correct: "In writing my stories the computer has helped me because now I can check over them and I don't have to always be rewriting. I spend more time 'writing' my stories on the computer but less time 'rewriting' them. I probably like writing better now when I use the computer because I don't use as much time to rewrite it so I can think more on the content of it."

The students handed in the copy of their "Cities" pieces of writing to be marked and so today was the beginning of the third Writer's Workshop assignment. Some students worked very slowly as they got started on their new writings. Michael had a really difficult time getting started again. He said he needed to think "a lot" before he wrote and so he

doodled and scribbled ideas down. Brendan quickly began his new story "about Mickey Mouse leaving Disneyland." He said it was "a real mess" as he "scratched it out" but that didn't matter because he would put it on computer later and then it would "look good." Like Brendan, Jennifer had no problem getting going on a new piece of writing. She wrote a poem about a goldfish and even had time to recopy it on green paper—her "good copy" she said. She told me that she was writing a mystery story at home on a typewriter. Her inspiration came from a neighbor she babysat for who was writing a novel on the typewriter and had "a five-inch-thick stack of his book already typed." She was doing it on the typewriter "just for fun" and because it was different than doing it on the computer or by hand. She wasn't concerned about re-typing it because it wasn't for school, although she did mention that the typewriter "had a corrector ribbon." It was apparent that Jennifer was a "real little writer."

Mr. Cambridge developed a new computer exercise for the week to teach more word-processing features and to review those already taught. The computer exercise was an excerpt out of the Boy Scout Manual which the students had to type into their own file. The word processing functions it asked them to employ included: centering, underlining, justifying, tabs, margins, printer commands for characters per inch, and, the new function, indenting. Students were free to work on the exercise or their Writer's Workshop writing. By having two possible assignments to work on, students who chose not to do their language arts writing on computer still had something else to do. Approximately one third of the students continued to work on their writing, while the remainder worked on the new exercise. Those who did their writing said it was more fun and useful than "a silly computer exercise."

Brendan, Jennifer, and Michael worked on the new computer exercise, methodically typing in the text and performing the various functions. Not much talk occurred among students as they worked. As students printed out their work and it did not work as it was supposed to, they returned to their computers and made revisions and then

went on to do many successive printouts until it was "perfect." They would not settle for anything less. While waiting for the printer, Michael watched Nikolai's printout of his Writer's Workshop story come off the printer. He commented on Nikolai's spelling of "lightening" for "lightning" and his use of the the word "fierceful." They got into a discussion as to whether or not there was such a word as "fierceful" and resorted to the dictionary for the answer. They found no such word but Nikolai found that "ferocious" was perhaps the better word. He returned to his computer to make the necessary change and then reprinted his work. He showed Michael the new copy and said, "It looks better, eh?" The public nature of the screen and printer seems to have helped the students develop a real awareness of words and language as they write, print out their writing, and then rewrite.

Week 7

Nicole conferenced with Ms. Marchand about the story she had started last week in Writer's Workshop. She finished writing her first draft at home and then used last week's computer classes to type her second draft on the computer. She said she would have preferred to have written it on the computer to begin with, but there wasn't enough time to do it in just four computer classes and she didn't have a computer at home. She did have time though to type her story on-line and would therefore be able to quickly do the revisions suggested to her by Ms. Marchand in their conference. Nicole had organized her writing according to time and access to the computer in a way that would be most beneficial to her.

Jennifer continued to look over her poem about the goldfish. I asked her if she was going to make another draft on the typewriter or put it on computer later. She wasn't sure because typing it would take quite a bit of time and if she had to rewrite it by hand it wouldn't take much time because if was so short. She saw the usefulness of the computer for her previous two assignments because "they were longer and if they needed corrections

and changes it would take a lot of time to rewrite them by hand." Due to her self-proclaimed slow typing speed and the length of her pieces of work, she determined whether or not the computer was beneficial for completing particular assignments.

Michael completed one paragraph in the story he was thinking about last week. His handwriting was so poor that he recopied this one paragraph into "better handwriting" so that Ms. Marchand would be able to read it when she came around to conference with him. Brendan continued writing his story from last week and was still planning to do his next draft on the computer. He wondered if he would have enough time in the computer lab this week to type his next draft onto the computer.

Beginning this week, the school hired an aide for the computer lab. This newly-created position would give the students access to the lab everyday at noon hour and three days after school. Many of the students were delighted to hear this and talked about their plans to use the time for their writing. More students than previously worked on Writer's Workshop assignments on the computers this week. Most had a handwritten copy or at least a story beginning to work from. The talk among them was almost exclusively related to their writing. Aman discussed possible titles for her story with the girl next to her. Jennifer, having decided to type her poem into the computer, got advice from Tanya that since she was writing a poem, she should center it under her title and on the page, "So it looks like a real poem." She formatted her poem after typing it all in and was most pleased at how it looked all printed on one page. By the time she handed in her poem, "Cleopatra," it was in its fifth draft.

Michael conversed with Brendan about how to spell some words he needed and commented that Brendan had made some errors in his work. Brendan said he could take care of those later and was now too engrossed in the actual writing to worry about spelling errors. Brendan busily typed in his story from his rough draft making many changes in the content of his story as he went. He told me, "I'm changing my story beginning a lot—making it better as I type it into the computer." He and Michael collaborated to add more

details to Brendan's story. As well, they discussed the appropriateness of certain features of Michael's now developing piece of writing: "What could he use for a weapon instead of a baseball bat? It would have to be something he would actually have in his bedroom. Nothing too phony." The talk that occurred between them was interspersed with periods when all four of their hands were working away on one person's keyboard. This was Michael's first story that he wrote completely on the computer at school. He said it was possible because the story was quite short and he did some work on it by hand each night at home before coming back to the computer lab.

Week 8

After marking some of their most recent assignments, Ms. Marchand had recognized that her students needed some practice in learning how to use quotation marks correctly. Together she, Mr. Cambridge, and I developed a computer exercise to help them achieve this objective and at the same time teach them some new word-processing functions. Ms. Marchand gave the students a mini-lesson on how to use quotation marks and their accompanying punctuation in their language arts class. The computer assignment that combined both language arts and word processing skills follows.

Who Said That?!

In your language arts class you have learned the rules to follow for using quotation marks and the accompanying punctuation. This exercise will let you practice what you have learned and also teach you some new commands to use with Appleworks. On your disk you will find some text from a play under the file name DIALOGUE. Follow the directions below to change the dialogue you find from a play into the way you would see it written in a story.

PART A: Using Quotation Marks and Accompanying Punctuation

1. Using the SEARCH AND REPLACE COMMAND, substitute the word **said** followed by a comma and an opening quotation mark in place of every colon. Replace them "all at once."

2. Place quotation marks around the exact words spoken (the actor's/actress's lines). Use (open Apple R) to change (.) to (.") one at a time. These two steps will give you properly punctuated dialogue.

Save your work and then make a printout of it before you go on.

PART B: Choosing Substitutes For the Word **Said**

In writing, some words "zing" while others "thud." A good writer knows the difference. When a writer has a thought to express, the skillful writer knows which words will make the thought interesting and colorful, and which words just sit there and are quite boring.

One word that just "sits there" is the word **said**. We can **say** anything. And we can say it in hundreds of ways. In fact, the English language is rich with verbs that describe speech acts very precisely. By choosing the right substitute for **said**, we can tell not only how something was said, but what the speaker felt and meant in saying it.

Some examples of words (speech verbs) that might take the place of **said** are:

abjure/ acclaim/ admonish/ advise/ answer/ apologize/ begin/ belittle/ berate/ brag/ censure/ chide/ chortle/ commend/ command/ complain/ condemn/ confirm/ console/ contradict/ crack/ criticize/ cry/ decline/ decree/ decry/ demand/ denigrate/ denounce/ deprecate/ deride/ dictate/ disavow/ disclaim/ disparage/ divulge/ enjoin/ entreat/ eulogize/ exclaim/ expound/ extol/ foreswear/ gasp/ grouse/ growl/ grumble/ gulp/ howl/ inform/ inquire/ lament/ laud/ laugh/ lionize/ malign/ mumble/ murmur/ muse/ narrate/ observe/ offer/ perjure/ promise/ protest/ quip/ rebuke/ rebut/ recant/ refute/ remark/ renounce/ reply/ reproach/ repudiate/ retort/ sigh/ snap/ substantiate/ suggest/ summon/ swear/ tease/ threaten/ venture/ verify/ vilify/ vow/ warn/ whisper

1. Use the FIND FUNCTION to jump to each occurrence of **said** and change it to something more interesting. (Make sure you know the meaning of the word you choose to replace **said.** Use a dictionary if you need to!)

2. Now go back to your text and using the MOVE COMMAND, change the structure of your sentences by moving some of the introductory phrases and placing them after the quotation marks or inserting them in the middle to create divided quotations. (Of course, other punctuation will need to be adjusted as a result!) Make sure you use at least three examples of each way of structuring your dialogue.

EXAMPLES:

1. **Jamie exclaimed**, "I can't believe how quickly I've learned how to use the word processor!"

2. "I just lost all my data," **cried Susie**.
or "I just lost all my data," **Susie cried**.

3. "Don't turn off my computer," **screamed Lisa**, "because I haven't saved it yet."

You may also like to add other descriptive words to some of your dialogue.

e.g. "I hope this command for saving my data works," John said **nervously**.

Save your work and then make a printout of it.

Smile, You're finished!

The text they worked with in the assignment was a play version of the short story, "The Open Window," by Saki.

Within a few seconds of loading their disks, Michael and Brendan replaced all the colons in the play dialogue with **said, "** using the SEARCH AND REPLACE COMMAND. They exclaimed at how fast and easy it was to do. The students were amazed at how quickly they could perform a global "search and replace" with only a few key strokes. Replacing the final period in each quotation with a period and a closing quotation mark required the students to use the FIND COMMAND. It was a little more tedious to do, but as Michael said, "It's a lot slower, but I might not see them for myself if the computer didn't highlight each one." Jennifer agreed with Michael's assessment

saying, "The second step of adding the closing quotation marks is slow but easier than reading it all and trying to find it on your own in the dialogue." The computer's ability to highlight each occurrence of the period really drew the students' attention to how the punctuation was used and required them to re-read the text in order to make a decision about what to do with each occurrence of punctuation as they came to it. For many of the students, the exercise made them ask questions about how to punctuate quotations within quotations and how to punctuate dialogue of more than one sentence in length spoken by the same speaker.

PART B of the assignment proved to be a lot more time consuming and taxing for the students than did PART A. Many students discovered on their own how to use the FIND COMMAND. Basing their exploration on previous experience they thought, "If [open Apple S] SAVEs and [open Apple D] DELETEs, then [open Apple F] must FIND." It appeared that the students were really employing thinking skills in an effort to complete the assignment. The new-found knowledge of how to FIND spread quickly around the classroom as students came to the second part of the assignment. Michael worked very slowly replacing "said" with more interesting and colorful speech verbs. He said, "I'm very careful about the words I choose to replace 'said' because I don't want it to be outrageous. I have to try to tell realistically what each character would be saying." He asked if at times he couldn't leave "said" in because he felt that at some points it was the most appropriate word to use.

When Tanya and Jennifer approached the second part of the assignment, they opened a new file called "Other Words for Said" and typed the examples on the assignment sheet into their files and added others they could think of as they went, discussing the meanings of all the words. They both thought it was important to have a list handy for when they did future writing but knew they would probably lose the sheet of paper. By putting it on disk they knew it would always be there and couldn't get lost. Etsko went a little further with this than did Jennifer and Tanya. She used a dictionary to find the

definitions for all the examples on the handout of replacements for the word "said." Her file included both the word and the appropriate definition.

This assignment tended to promote a very collaborative working atmosphere as the students chatted amongst themselves asking each other what certain words meant or if they used them appropriately in their text. The dictionary was very much in demand throughout the classroom. Brendan and Michael tried very hard not to use the same speech verb twice as they contrasted and compared their choices discussing and defending why their choice was most appropriate. Perhaps the most important language learning exhibited through this activity was a real concern for words and their meanings. It challenged the students to choose speech verbs that were appropriate in both tone and meaning to plug into an already existing story form. The computer added to the activity because of the ease with which words could be added or deleted without rewriting the whole dialogue. The computer allowed for the students' concentration on the appropriateness of their word choices (and the ability to easily and "cleanly" change their choice) for replacement rather than on retyping the whole exercise. Retyping would have taken considerable time and would have become more of a typing or keyboarding exercise and not an exercise focusing on appropriate diction. At this point it might appear to have been a computerized "fill-in-the-blank" exercise but the last part of the assignment made it more than a skills exercise. It asked them to go back to the text and use the MOVE COMMAND to change the structure of their sentences by moving some of the introductory phrases and placing them after the quotation marks or inserting them in the middle to create divided quotations. Punctuation would also be readjusted as a result of the moves. It was interesting to note that none of the students chose to re-type the whole dialogue as some had done earlier in the "about me" assignment.

Week 9

Jennifer completed PART A of the quotation assignment and when she went on to PART B she chose to go through and perform the remaining requests of the exercise one sentence at a time. She went through the text choosing and inserting her new speech verbs and at the same time making moves and modifying punctuation. Carefully choosing her speech verbs as she placed them in various positions in the dialogue, she reread what she had written previously so that she didn't repeat the same word too close in succession. She was very conscious of what was being said in the dialogue and the tone it imparted, so much so in fact, that she would read ahead in the dialogue to make sure that what she was about to write would make sense with the dialogue that would follow it. For Jennifer the editing was more than just doing the changes line by line; there was a "whole" sense of what was happening in the story. Both she and Michael asked if they could add more words to the story to make it "flow better." Michael said, "Otherwise, it's just him talking and then her talking." He continued to do his work slowly and deliberately making all deletions and additions to each sentence one at a time to make sure "it made sense" and "sounded right" for what he wanted to say.

After they had worked on the assignment for about a week, students started to ask what happened at the end of the story (the end was not included in their text). This one question indicated that the students were really looking at the context of the exercise and not just performing the changes in text and computer functions for the sake of completing the exercise. Upon being told the actual story ending, the students easily connected it back to the portion of the story they had worked with and made sense of some of the finer story details: "Oh, so that's why she kept asking him if he knew anyone from around there!" Besides teaching the students three new word-processing features, the "Who Said It?" assignment promoted language arts objectives which included punctuation, spelling, vocabulary development, story flow, and speaker's intent.

Week 10

In the last week before Christmas vacation, students spent their time doing revisions on the final copy of their last Writer's Workshop assignment, completing the "Who Said It?" exercise, starting new stories and poems, working on other pieces of creative writing they had started previously, or going back to their computer assignments on tabs and indenting to make more changes. Anne wrote her "Secret Santa Letter" on the computer so that her handwriting would not give her away. Brendan and Nicole used their time to make revisions in their Writer's Workshop story and printout a new copy for Ms. Marchand. Shannon worked on a story she started a few weeks ago but hadn't been able to complete. She said had it not been on a disk she probably would have lost it. As with a writing folder, works in progress could be added to, revised, and saved for future use. On disk, it was even less cumbersome than on paper. All of the students were busy doing something of their choice without the teacher having to tell them what to do.

As I left the grade seven classroom for the last time I wondered if some of the students would continue to use the computer to do their writing even after they were no longer given computer-class time for their writing. Jennifer and Michael said they would for sure because they had computers at home to work on. They qualified that they would use it mostly for any assignments that were long, such as stories or perhaps social studies reports. Brendan said he too would continue to use the computer, making use of the extra lab time after school and at noon hour. Using his cousin's Macintosh was another alternative he thought of if he couldn't use the school computers.

I returned to the school early in the new year to visit Ms. Marchand and I asked her if some of her language arts students were still using the computer to write even though they were not using it specifically to learn word processing in computer class. She responded:

> Oh yes. Some of them have come in already saying, 'I've written another story on the computer' and some of them are really little addicts. They are into typing and are in the

> computer room constantly. A lot of them have also gone back to their freehand, because they don't have enough computer time, until it's time to type them in and then they might do two drafts. Whereas, when they have the computer time they do up to four drafts on the computer. It depends on what their priority is at the time. If I put the emphasis on Writer's Workshop and say this is what I expect in such and such a time, then given the time they really focus on it.
>
> In their Anthologies a lot of them would type out their little poems and cut them out in clouds or something and glue them onto colored paper. Others did entire presentations right on the computer with computer graphics for illustrations. That was an assignment that was given no class computer time. I think it really depends on what they preferred. It's a very individual sort of thing.

It seemed like the experience the students had using word processing to write, had really had an effect on all of the participants in the study. There were problems and there were benefits with using word processing in a classroom environment to complete language arts activities, but it had made an impression. Writing has always been a very "individual sort of thing" and the use of a computer to write hadn't changed this feature of writing. What the computer had done, was add another alternative to an already idiosyncratic process.

Chapter V

SUMMARY, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Summary of the Study

Purpose

The purpose of this study was to contribute to our understanding of the nature of the encounter between students and computers in the classroom. The focus was on describing the interaction that occurred between grade seven students and computers as the students used the computers primarily to accomplish language arts activities, while at the same time they learned how computers functioned. I sought to learn, through the students' reflections and behaviors, more information about what it is like for students to use computers and, thus, how teachers can better make use of computers in the language arts classroom. It was fundamental to the study to observe the students in a classroom setting.

Methodology

As the researcher, I entered the environment of the students—their classroom. I observed the students for approximately three months, every day of the week, one day per week in their language arts class and the other four days in their computer class. Upon entering the students' classroom, initial data concerning the students' perceptions and experiences of language arts and computers were gathered by having them answer a brief questionnaire. Three students, each possessing a different level of experience using computers, were then selected to be used as key informants through the course of the study.

Data collection consisted of three strategies. The main data collection method employed was free-form observation. I adopted the stance of a participant-observer in the classroom helping the classroom teacher as would an aide, and at the same time recording

my own field notes as I observed and talked to the students while they worked. Interviewing, both formal and informal, was used to uncover personal meanings held by the various participants in the study. Some basic questions were used to guide the interviews, but I attempted to keep the interviews as conversational as possible. Informal interviewing was ongoing, while more formal taped interviews were held twice with each of the students chosen as key informants and once with each of the participating teachers. The third data collection method, document analysis, consisted of collecting and examining any written material available to me and relevant to the topic. Such documents included teachers' assignments and students' work.

Presentation of Data

The presentation of the data consists of a chronological story of the experiences of grade seven students using computers to accomplish language arts activities and to learn how a computer functions. All of the data collected through observation, interviews and document analysis were compiled into a detailed descriptive narrative of the classroom situation observed. The story focuses on the daily experiences of the students and their comments about using computers to complete language arts activities in a classroom setting.

Findings and Conclusions

This study was limited in that the school described in the study was not chosen randomly and only one classroom was observed for the purpose of this study. The observations occurred for only about three months on four days per week of the students' computer classes and only one day per week of the language arts time alotted for these grade seven students. It is, therefore, not possible to generalize beyond the limitations inherent in this study. However, certain observations can be made concerning the experiences of the students using computers for language arts activities in a classroom

setting. The observations are presented in the form of answers to the research questions predetermined to be likely areas of interest with which the study was concerned.

1. What is the nature of the students' encounter and experience with using microcomputers for grade seven language arts activities in the particular classroom being studied?

Overall, the general comments made by many of the students and by the two teachers in the study to describe their experience with using computers to accomplish language arts activities was that it was a very **positive** experience. The reasons why the experience was generally recognized as being a positive one are more specifically described in the following paragraphs which attempt to thematically organize the reasons why using the computer to write was such a beneficial experience. The most apparent benefits appeared to be in four major areas: student attitude toward writing; social organization in the language arts classroom; presentation of student writing; and the computer functioning as a helpful tool.

One of the most common words participants used to describe the experience of writing with the computer was that it was "fun." For Brendan, it was more fun to write with the computer because of the computer's ability to manipulate and play with text. He said it was "fun to play with words, fonts, spacing and formatting." The computer added a dimension to this student's writing not as easily or functionally available to him when writing with traditional pen and paper. What Michael said about the act of writing was that "It's not fun because it's work, but it's [writing on the computer] better than handwriting. It's less like work than handwriting."

Ms. Marchand's reflection on her students' use of the computer for writing also comments on how the computer makes writing more fun. Concerning writing on the computer, she said, "It's not as laborious. It becomes a fun thing to write. They can share

and think at the same time and write. It's so much faster and so much more efficient for them. It becomes a joy instead of a 'God I have to write' painful sort of process."

Not all students embraced the new writing technology as positively as perhaps the three key informants in this study, but a sense of writing enthusiasm did exist generally among the students. The computer became for the students a creative tool that could help them in their writing. Having this control at the touch of their fingers gave them a sense of power over their writing and made it more "fun." Most students' attitudes toward writing, and especially the revision process, appeared to improve.

Ms. Marchand's words about students sharing while they wrote points to another positive aspect of writing with a computer—fostering a sharing environment. Both the teachers and the students found that writing on a computer encouraged collaboration among writers, facilitating the sharing of writing concerns and the development of strategies for solving both writing-related and computer-related problems. Students were observed trying to solve their own computer or writing problems amongst themselves before they went to the teacher for help. Student talk in the classroom early in the study often focused on how to make the computer function, but soon changed to writing-related concerns (spelling, diction, syntax, story content) and evaluative advice on whether or not another student "liked" the piece of writing in question. The misconception held by many that the computer in the language arts might "dehumanize one of the Humanities" was not at all apparent in the classroom being studied. A sharing classroom climate developed through the course of the study, one which students tried to carry back into their language arts classroom and into the computer test Mr. Cambridge had them do. Task-related talk became a way of functioning for the students. Generally, students using computers for their writing tended to spend more time discussing their writing than those who did not use the computer.

The subject of collaboration brings into question the public nature of the computer screen. Those students who preferred to keep their writing-in-progress more private chose

to sit at the computers that were more isolated from the rest of the class, thus limiting the degree of exposure of their writing-in-progress. The public display of their writing did not create a problem for most of the students as they did not mind that the screen made it possible for all to see their individual writing. Students who were not concerned about the lack of privacy engaged in a great deal of task-related talk and often seated themselves at computers where such talk could easily occur. Such was the case for Brendan, who said, "Writing with the computer was fun. When I wrote on the computer I talked more with the people around me because people could look at it and we could discuss it."

The presentability of students' writing was one of the most prevalent benefits of utilizing computers in writing. "The computer makes my writing look good!" was one of the comments made most frequently by students. The neat, perfectly-formed letters on the screen or page produced a positive experience for most students, especially those with poor handwriting. Ms. Marchand related an anecdote about Dominic, a student whose handwriting was unintelligible and who never handed his work in, and how the computer suddenly made it possible for him to be a writer because the computer helped him produce good work that was legible:

> There were very few errors by the time he was finished with it. When you have bad handwriting and suddenly it's easy to read, students realize, 'Boy, I'm not so stupid after all.' Presentability. Like Dominic. You should see Dominic's thing. You'd freak. He's so proud of himself because suddenly there was this wonder thing that helped make him look quite intelligent, instead of all this chicken scrawl.

Because the computer produces professional-looking text, using it stimulates students to write something that can be unabashedly shared within or outside the classroom. The legibility the computer provided for students' writing was a positive outcome for both the students and the teacher. A comment made by Ms. Marchand about "discovering" Michael's writing ability because the computer made it readable illustrates the revelations teachers can make by reading legible student writing.

Students appeared to get more satisfaction from their work because it looked like "real writing" and it made them feel like "real little writers" who had a sense of authorship. The computer provided the students a sense of control over their writing in the range of choices they could make about the formatting of their writing. Michael said, "It adds to your writing because you can do the right margin and the left margin, space in between , centering, underlining." Brendan appreciated the ability to "play" with his text: "You can make it look neat and you can do all sorts of things. You can change the type style. You can have even spaces. It just looks neater. It's easier to sort of play around with the words than when handwriting. You can delete and play around with it and see what's good and once you find what's good, you can save it and make as many copies as you want. It's fun and easier and it looks neater." The computer allowed students the power to experiment with the format of their writing and to make it look better than was possible with traditional pen and paper.

The final reason why the nature of the students' encounter and experience with using microcomputers for grade seven language arts activities was viewed as being positive was that the computer was seen by the students and their teachers as being "helpful" to their writing. Perhaps it was the area of revision that benefitted most from the use of the computer in the writing process. The ease and speed with which revisions could be accomplished encouraged students to effect the revisions that were suggested to them by both their peers and their teacher during their writing conferences. Students came to see their piece as a "draft" rather than a finished product and they welcomed suggestions for revisions rather than feeling anxious about them because they might have to recopy the entire text in order to revise. Ms. Marchand recognized the change in attitude toward revision: "I don't get whines anymore. Like before if I asked for an essay or something, they'd say, 'Well how many copies do we have to do? Do we need a rough copy?' And now, my kids say, 'Okay!' and they immediately start with a first draft and nobody asks me how many copies. They say, 'Do we keep all our drafts?' So revision has become sort

of second nature in the process." The increased ease the computer added to the revising process helped students develop a more positive attitude toward revising and writing. "In writing my stories, the computer has helped me because now I can check over them and I don't always have to be rewriting. I spend more time 'writing' my stories on the computer, but less time 'rewriting' them. I probably like writing better now when I use the computer because I don't use as much time to recopy it so I can think more on the content of it," said Brendan about the helpfulness of the computer in his writing process.

Students also found the computer to be a helpful tool because it objectified their writing. Somehow, writing on a computer is different than writing with pen and paper as the words on the screen become separated from the writer and take on a life of their own. The following comments of each of the three key informants in this study implicitly seem to address this objectification the computer makes possible. Brendan said, "When I write on the computer, I can think while I write and see it right in front of me." Michael felt the computer was helpful because when writing "It's hard to think. It takes a lot of time. Just sitting there looking at the screen, it usually gives me ideas and I start writing. It's easier to write and think it right into the computer." "On the computer," Jennifer said, "it's easy to just write right out of my head. I don't really know why. It just pops into my head, all these weird ideas, and it's fun to just type them. It's easier to type things when they pop into your head than to write them on paper."

The computer objectified students' writing in another way as well; the computer made it easier for the students to find mistakes in their writing. Brendan's comment shows us how the computer helped him in this particular area: "My handwriting sometimes gets all crammed together. In my writing, I know what I was trying to write so it looks the same to me even if I left out a letter or something. But on the computer it looks way different if I left something out. On the computer you can really see it because it stands out." Handwriting, especially poor handwriting, often hid spelling and punctuation errors, but the perfectly-formed and spaced letters on a computer screen or printout helped to

disentangle the students' writing and helped them gain a competence otherwise unavailable to them. The computer became a writing tablet that depersonalized the writer's handwriting by turning a writer's words into typewritten text, making it easier for students to see the errors that might otherwise be hidden in their scrunched handwriting. For some, the computer became a machine that could help them transcend their past inadequacies with handwriting and help them achieve success by making it easier to work with their writing in process.

Although the students' experience was for the most part a positive one, there also existed some frustrations with writing on the computer. The biggest drawback of writing on-line concerned the subject of time. Early in the study, access time to the computer lab was limited to the scheduled time each class had on the timetable. This problem was alleviated somewhat when later in the year the school hired a computer lab aide, thus making the lab available at noon hour and after school for student use. Time, or the scheduling of time also created some frustrations when writing assignments were due to be handed-in to the language arts teacher. These problems were solved by the two teachers working more closely together on their scheduling and by informing students of deadlines earlier.

The immense amount of time it actually took to write, especially if one's keyboarding skills were still in the novice stage, also became apparent. At first, some students could not see the benefit of writing on the computer because it appeared to be more laborious than handwriting, but they soon realized that the time spent in the initial draft was easily more than made-up for when making revisions. The access time students had to computers governed which of their writing they would do on-line and what they would do in handwriting. Those pieces which would require revisions and which might take a long time to recopy by hand were often the choice for doing on the computer. Daily and short assignments were more easily done by hand and allowing more computer time for those assignments given "computer priority" by students. Due to the lack of time available on the

school computers for writing, students would often handwrite their first draft at home and then do all subsequent drafts on the computer. After the school hired a full-time computer lab aide, students had more access to the computers for writing. Even after this study concluded and students' computer class time switched to focus on databases, many students continued to access the extra time at noon hour and after school to do their writing.

Another apparent problem, related to the area of keyboarding, that evolved when students used computers for their writing was that of new writing errors. The abundance of typographical and formatting errors concerned the language arts teacher. The formatting errors were easily dealt with as students were provided accurate information about correct formatting (e.g. two spaces after end punctuation marks). The problem with typographical errors raised a new issue—the use of spelling checkers. The teachers were still considering this issue when I concluded my study.

These more negative experiences with using the computer to write were generally experienced by most students but were not seen as ongoing problems. Experience in keyboarding gained with practice and over the time of the study, reorganization and rescheduling of assignment due dates by the teachers, and the added resource of a full-time computer lab aide all helped to solve the problems experienced by the students.

On the whole, it can be said that the nature of the grade seven students' encounter and experience with computers to perform language arts activities was positive and beneficial for students' writing. The computer made writing a more enjoyable and collaborative activity. Students appreciated the capacity the computer has to make their writing "look good" and to do so with ease and speed. The computer was also viewed as a helpful tool aiding students in their revising process and objectifying their writing for them.

It can be concluded that there are many clear benefits to using computers at the grade seven level to accomplish some language arts activities. There are also some problems that the computer introduces into the language arts classroom. In my opinion though, the problems made evident by this study were quite easily solved, or solved

themselves, and the benefits of using the computer in language arts far outweighed the problems.

2. What insights into grade seven language arts can be gained from the behaviors and comments of students utilizing computers in the classroom?

As a writer and a teacher of writing, I held an assumption that all writers were reluctant to share their work in progress and thus the public nature of writing on a computer would be a problem in a classroom situation where many students would be writing on computers at the same time. From the study it became evident that students were really not so apprehensive about their text being displayed on the screen for passers-by to see and read, as adults might think they would be. In contrast, most students actually appreciated and welcomed the advice and suggestions they got from their peers, their teachers, or me. The creative collaborative environment that develops in the computer classroom provides teachers an insight into the desired social interaction these grade seven writers found useful as part of their writing process.

The actual time it takes for "good" writing to occur was also made evident through the study. Because many students did all of one or more of their writing workshop assignments during the time I observed them in their language arts and computer classes, I was able to actually observe the immense amount of time it takes for a grade seven student to write what could be determined a "good" piece of creative writing. Spending approximately three months with the students on a daily basis and seeing them in the act of writing at the computer and examining their numerous drafts, it became obvious that writing is a very time-consuming process. Even with the use of a computer to easily and quickly make revisions and print an improved draft, it took these grade seven students almost three months time in class and occasionally for homework to complete three writing workshop assignments. As teachers we can learn from this study that writing that encompasses the whole writing process does require a great deal of time on the part of the

writer. If we expect students to do their writing on computers during class time, they will need a great deal of access to the computer outside class time as well.

As mentioned previously, the computer helped students understand that revision is an integral part of the writing process. The computer did not teach the students how to revise, the teacher did. The computer only gave the students an increased ease with which to perform the revising process and helped students develop a more positive attitude toward writing. The degree of comfort exhibited by students during writing conferences could be related to whether or not the suggested revisions would be easy to make because the draft had been completed on the computer. Those students who had used the computer welcomed suggestions for change, while those who had typed or handwritten the earlier draft appeared anxious and unexcited about recopying the text in order to improve it. The computer used as a writing tool clearly has given teachers some insight into the revising stage of the writing process. The students learned that revising is really a part of the writing process and they were able to articulate the process more clearly.

The opportunity to observe students writing using only the computer, only pen and paper, or a combination of both, strengthened the fact that each of us has a personal way of writing. The study also reinforced for Ms. Marchand, the language arts teacher, the idea that writing is a very idiosyncratic process:

> The whole concept that we are all writers and we all write in our own way really became evident and evident for the kids too. They realized that they didn't have to write like Joe or Sally sitting next to them because they didn't have to write on the computer and they didn't have to write by hand and neither was wrong or bad. They really got a sense of 'Here I am. I am a writer. I have my own idiosyncrasies. If I need to write in such a way or in such a manner or on such paper, then I can do that!'

I felt that the students really gained a sense of how individual a thing writing is, if only through their observations of one another while writing at the computer. The most evident differences were visible in when and how students chose to use the computer formatting options in their writing, as well as at what point in their writing process, if any, they chose to use the computer for their language arts assignments.

Perhaps the greatest insight about grade seven language arts gained from the study of students utilizing the computer for writing was the re-found empathy felt by Ms. Marchand for the struggle her students were experiencing as they progressed through the writing process:

> We forget what it's like to be twelve and to write. For us, probably as writers, we go home and bang something out on the typewriter because we're angry or we're happy or something. Or we might write for functional reasons and we forget that these little guys are experimenting for the first time. *Really* experimenting because they're just coming into their own being as little adults. When it's on the computer I can see the problems that they have just in the first or second drafts. I see how much they have to do to make a decent draft, and that using apostrophes isn't second nature, and that using subject-verb agreement isn't second nature, and those things have to be gone over every draft. I guess I tend to forget that when I see them handwriting because I don't see it. Before the computer project I wasn't saying that you have to do these drafts. When I started insisting on drafting and conferencing, I suddenly started to realize that, oh God, these poor little guys have so much to deal with. Not only their ideas and their frustrations and their feelings that they're trying to put into words that other people can understand, but the fact that the process itself is really filled with all sorts of complications.

Just as the computer screen or printout had helped students see their own writing problems, it also helped the language arts teacher to see and re-experience what it was like to be a beginning writer. Her insight into this facet of grade seven language arts caused her to reflect on what it is to write and more importantly, what it is to teach grade seven students to write.

The insights gained from the study of grade seven students utilizing microcomputers in the classroom appear to be related to writing in general in addition to writing on the computer specifically. This study of observing students write on the computer helped to focus my attention, and that of the two teachers involved, on the nature of writing for a grade seven student. The computer provided the opportunity to see on the screen and in numerous drafts the writing processes of the students.

3. Do students perceive shifts in their roles or in their teacher's roles, or changes in classroom atmosphere as a consequence of the introduction of microcomputers? If so, what is the nature of these changes?

The collaborative classroom environment created by the introduction of microcomputers was the predominant shift observed by both the students and the teachers. All participants felt that when working with the computers, more student collaboration occurred. Students could constantly be seen helping one another with either a computer-related concern or a writing concern. Students perceived that more student interaction was allowed for in the computer lab than in the regular classroom.

The students also felt that when utilizing the computers, they spent more of the class time actually working and much less time listening to the teacher talking. Their degree of active participation increased as the teacher became more of a facilitator, organizer, and helper especially with the computer-related problems students experienced. Mr. Cambridge demonstrated to the students what word processing could be used for and helped the students to become more adept users. With respect to writing concerns, the teacher was viewed as a catalyst who helped students initiate or progress in their writing and as an editor who helped them effect revisions in their writing. The teachers and I became collaborators—both with each other and with the students—in activities which were mutually interesting and rewarding because we all shared in the same objective: to help the students become better writers aided by the technology afforded to us in the form of computers.

4. What is the role of the computer in students' learning and 'languaging' in language arts?

One role the computer can play in students' learning and 'languaging' in language arts is to help students understand and see themselves as 'real' writers. The capacity the computer has to produce perfect typewritten text gives the students a sense of authorship

because their writing looks like something they might see in a book. Ms. Marchand thought that the computer helped students see themselves as "much more important writers.... When they share they're very proud of their work and they like to display their work and they like to conference on their work and it's very important to them and it's theirs!" It appears that the computer has the potential to alter how student writers' view themselves in relationship to their writing. If the computer can inspire a pride in students as writers, it has a role in the language arts classroom as a motivator in the writing process.

The computer appears to give students more control over their writing, and thus, their thinking. When the learner is in control and has more power to create, the learner seems to become more conscious of his/her writing process. This was clearly the case in the area of revision in the students' writing process. The computer alone could not and did not teach the students how to revise, but it did enhance their use of language and help the students learn that revising was a part of writing. Ms. Marchand summarized this concisely when she said, "[The students] learned that revising is really a part of the writing process and they were able to articulate the process more clearly. They started out talking about computer talk and then it became writing talk. It just became another tool. This is a computer and it is an extension of my hand because I am going to write. It's a catalyst for a writer." The computer enhanced language use about writing by making the writing process more perspicuous for students. The computer helped students to see and effect changes in their writing as they used it to facilitate thought about their writing process.

The logical manner in which the word processing program the students were using (*Appleworks*) is designed encouraged students to experiment and use their logical thinking skills to perform new computer functions that they found a need for, but had not yet been taught. The forgiving nature of the program allowed the students to adventure into the formatting options, such as underlining, and feel a sense of discovery when they were successful in influencing the program to do what they desired. Students linked prior knowledge with new knowledge in their self-exploration of the computer program. The

computer can thus have a role in students' learning by promoting logical thinking skills and discovery learning.

Through using the computer, some students learned general concepts about standardized practices in writing, especially the area of formatting. Michael said that "the indent I learned on computer is supposed to be five spaces in either handwriting or typing." The computer performed the role of assisting students to gain control of writing conventions relevant to all of their writing, not only that done on the computer.

Clearly, the computer has a role in language arts classrooms in facilitating the teaching and learning of the writing process. It has the ability to motivate and encourage student writers by improving their self concept as writers. By providing the students more direct control over their writing, it appears that students become more conscious of their writing process. The forgiving nature of the computer allows for students to use discovery learning and logical thinking to learn new computer functions to assist them in their writing. Finally, the computer helped draw students' attention to the conventions of writing, giving the students more control over all of their writing.

5. What do we need to provide in a classroom computer environment to teach language arts?

The greatest realization that comes out of this particular study is that it is not, and cannot be, the sole responsibility of the language arts teacher to teach students how to use a computer. Had Ms. Marchand been left on her own to introduce computers into her language arts program, I sincerely doubt that she would have because of her feeling that the computer was "a foreign instrument and I don't want to touch it." But when the occasion arose for her to work collaboratively with another teacher and myself, she seized the opportunity to learn more about the computer and how it could be useful in language arts.

One of the best ways for teachers to learn about computers is for them to work cooperatively with other teachers and with their students. The role of the computer in

society in general, and its use in language learning specifically, is significant and it is apparent that teachers cannot ignore it. In order for a computer project such as the one in this study to work, Ms. Marchand said, "I think you have to have teachers who are willing to work together. The teachers who teach my language arts kids computers are extremely supportive of what we're doing in language arts and so they are always willing to be there and to help. It's symbiotic. As [the study] progressed, I suddenly became so aware and really excited about the fact that this is one of the ways that computers can be dealt with." Ms. Marchand's comment clarifies that teachers need to understand how computers can be used in the classroom so that they can maintain control of computer use. By ignoring computer technology, control might be given to people who do not understand how writing and language are learned. We obviously need language arts teachers who feel comfortable with computer technology (or at least can work collaboratively with another teacher who is comfortable with computers) to combine computers with language arts in order to get the most benefit out of utilizing computers in the language arts.

The language arts classroom is not the place for students to learn how to operate the computer, but it is definitely the place for students to use the computer for writing. In this study, the computer class that had been scheduled into the students' timetable provided the place for teaching the students a course on how to operate the computer and proper keyboarding. If students are to use computer technology efficiently, they need to know some basic computer operations and keyboarding. Although I feel the language arts classroom may not be the place for this learning to occur, I would not prevent my language arts students from utilizing the computer because of this. From the observations made in this study and subsequent ones made in my own classroom, it takes students a minimal amount of time to learn basic computer functions. A few noon hours of a student working with a typing tutor program could make him or her proficient enough in keyboarding to use word processing. Ultimately, in the future, language arts teachers will be able to use the

computer as a tool and not have to worry about teaching students computer operations and keyboarding as students enter our junior high classrooms already armed with such skills.

For students to become adept at both keyboarding and using the functions available in word processing, they must participate in meaningful activities such as writing. Keyboarding and operational knowledge are not goals in themselves, but are skills to be used to achieve language arts objectives. When the skills are developed in a practical context, the learning is more meaningful. It is not necessary to teach all the capabilities of the word processing program before the students begin to use it to write. Students identify their own needs as they write and thus learn each new function in a meaningful context—when they need it for their writing! In this study, computer time became writing time because the students used their computer time for something real. Mr. Cambridge reinforced the importance of providing meaningful activities for students to learn computer operations and to practice keyboarding: "I think if you try to teach things in isolation, kids don't see a need for them and it doesn't go over as well. When they can see it as being useful in language arts or social studies or whatever, it becomes beneficial."

The study also elucidated that if students are going to use computers in the classroom for writing in a process-oriented way, they need to have a lot of access to the computers because writing, especially first draft being written by a novice keyboarder, takes a significant amount of time. Students and teachers in the study also recognized that the organization of time changed when using the computer for writing. More time was needed for initial drafts, but much less time was required in the revising and editing stages of the writing process.

In terms of what we need to provide as software programs for use in the language arts, the study illuminated that if you make the technology fit the language arts program and not vice versa, one of the most beneficial pieces of software is a word processing program. Ms. Marchand conducted her grade seven language arts class according to a writer's workshop model adapted from Nancie Atwell and so the place for computers with her

language arts students was in the writing process. Word processing became the perfect computer companion for the writing process focus in the classroom studied. Linking word processing with writing process allowed students to use the strengths of the computer to complement their writing.

Recommendations for Further Research

This study identified something of what the experience is like for a grade seven student to utilize a computer for language arts activities in a classroom setting. Increased access to computers both at home and in schools allows increasing numbers of students to use computers for a variety of learning activities. The possibilities for further research involving computers and language arts are numerous. The study discussed here could be researched again observing students in a different grade. The following are examples of questions for further research:

1. It appears that writing on the computer promotes more collaborative writing among people in the same room. How will this new writing environment affect the individual writer and the idea of individual authorship?
2. Advancements in computer technology have incorporated powerful and intelligent tools for checking spelling and grammar into word processing programs. What effect will these new writing tools have on the teaching and learning of writing?
3. Does the ease and speed with which editing can be done in writing when utilizing word processing encourage students to overedit?
4. Computers of the future will be able to perfectly accomplish voice recognition. How will this affect the "writing" process?
5. With new advancements in artificial intelligence, what might the computer do for the language and thought of our students?

Concluding Statement

This study of grade seven students using computers in a classroom setting to accomplish language arts objectives was a very valuable experience for all of the participants involved. The students and the teachers learned more about both the writing process and the capabilities of word processing when used by the students' primarily for their writing. Students and teachers became more comfortable with the relationship between the writing process and word processing. The computer was seen as a powerful tool for enhancing students' writing but it did not teach students how to write; that was the domain of the teacher. The computer's ability to edit allowed students to revise their writing more easily; the public nature of the screen encouraged students to discuss and share their writing in process; and the printer permitted students to make polished copies of their writing to share with others and to display in their classroom and their school.

As computer technology continues to advance and influence our society, it is the responsibility of language arts teachers to determine how this technology will influence how our students will learn. Whether or not students will make use of computers in an efficient and productive manner in the language arts classrooms of the future is a question that we as language arts teachers must face. The ultimate question is one of control. If teachers and students assert how computers are employed in education, then we can determine how this technology will influence students, teachers, and language learning.

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